The Builder.

VOL. XXIX.—No. 1487.

Royal Indian Civil Engineering College, Cooper's Hill, near Staines.

THIS mansion, until recently the residence of Mr. Albert Grant, for whom it was erected by Messrs. Myers from the designs of Messrs. F. & H. Francis, architects, is placed on property originally attached to the nunnery of Ankerwyke, in Buckinghamshire, on the opposite side of the Thames, in the reign of King Stephen. It was, some six months ago, purchased by the Indian Government, and placed in the hands of their architect, Sir Digby Wyatt, for adaptation, by certain alterations and additions to the existing building, and the erection of an entirely new block, to its new purpose, that of a Civil Engineering College for India.

The object held in view in making the alterations to the mansion was to utilise, as far as possible, existing arrangements, and to avoid any serious, and therefore expensive, interference with the main structural features. A glance at the ground plan* will show that this has been successfully accomplished, and most of the rooms have been adapted to their new purpose without undergoing any vital changes.

The principal staircase, with which the architect was loath to interfere, but which of course could not be common to the professorial, domestic, and students' departments, has been left intact, and the difficulty of providing separate access to those departments has been surmounted by the addition of the two new staircase turrets shown on the plan. These lead to the president's and professors' apartments, for whom fitting accommodation has been provided on the first and second floors. The offices for the resident officers are in the basement. In addition to the president's and married professor's quarters, accommodation is provided for three unmarried professors in the mansion.

The four class-rooms are 30 ft. by 30 ft. 6 in., 18 ft. by 25 ft., 25 ft. by 30 ft., and 22 ft. by 27 ft. respectively; the library, 20 ft. by 50 ft.; reading-room, 20 ft. by 16 ft. 6 in.; model-room, 20 ft. by 23 ft.; lecture theatre, 29 ft. 6 in. by 47 ft.; dining-hall, 22 ft. by 60 ft. 9 in.; billiard and recreation room, 22 ft. by 34 ft.; kitchen, 24 ft. by 30 ft. 6 in.; servants' hall, 18 ft. by 24 ft.

The professors' rooms are on the first and second floors, and do not appear, therefore, on the plan we give. The portion of office building from "still-room" to "coals" inclusive (shown by the shading on the plan), has been raised by two stories, and the remainder shown as shaded is entirely new. Accommodation is thus provided for the president and his family, one married professor and his family, three unmarried professors, the steward, 100 students, each of whom has a separate room, and the college servants.

In addition to the alterations to the mansion and the erection of the new block we have already described, five residences for professors have been erected on the estate, within a short distance of the college, comprising one single and four semi-detached houses.

Considerable alterations have been made in the stable block to adapt it as residences for married servants.

The contractors are Messrs. Ashby & Horner, whose resident foreman on the works is Mr. Winney. Of various sub-contractors, we may mention Messrs. Easton & Amos as having executed the water supply; Messrs. Baily & Sons, the cooking apparatus; Messrs. Thwaites & Reed, the clock; Mr. Samuel Gale, the hot-water apparatus and electric bells; Messrs. Lawrence the lifts; Messrs. Forrest & Sons, the gasfitting; and Messrs. Macfarlane, the iron gutters and finials.

Mr. John M. Gritten is the clerk of the works; and his father, Mr. H. F. Gritten, is the surveyor employed by Government to take out the quantities and adjust the accounts. The whole has been carried out from the designs and under the superintendence of Sir M. Digby Wyatt.

The works were commenced on the 1st of February of this year, and have been pushed on by the contractors with the greatest vigour; the president has been some time in residence, and the remainder of the building is formally opened this day, August 5th, with the following staff:—The President is Lieut.-Col. Chesney, of the Royal (Bengal) Engineers, well known for his distinguished career in India, and for his valuable contributions to current literature. Col. Chesney was severely wounded at the siege of Delhi, and held the appointments of Principal and Professor of Engineering at the Civil Engineering College, Calcutta (1859 to 1860), and Accountant-General to the Indian Government from 1861 to 1870. His chief literary work is "Indian Polity," and amongst his various contributions on military and other subjects he is the author of the article which recently attracted so much notice, under the title of the "Battle of Dorking."

The Professor of Construction, Mr. Callcott Reilly, M.I.C.E., is well known as an eager inquirer into the principles of iron-girder bridge construction, and for the published results of his investigations.

The Professor of Mathematics, the Rev. J. Wolstenholme, late Fellow of St. John's College, Cambridge, graduated as Third Wrangler in 1850. With Mr. Frost, he is a joint author of a treatise on Analytical Geometry of three dimensions. On several occasions he has acted as an Examiner at Cambridge for the Mathematical tripos.

Major W. H. Edgecome, Royal (Madras) Engineers, the Professor of Surveying, was formerly Superintendent of the Topographical Survey of Pegu, and for some years of the Civil Engineering College at Madras.

The Professor of Experimental Science is Mr. Herbert M'Leod, for many years assistant to Professor Frankland.

Lieutenant G. S. Clarke, Royal Engineers, the Instructor in Mechanical Drawing, passed out first with great distinction from the Royal Military Academy, Woolwich, in 1868.

The Instructor in Landscape Drawing, Mr. Samuel Evans, is an Associate of the Society of Painters in Water Colours, and Drawing Master at Eton College.

We shall look anxiously for the proceedings of this organisation, and shall hope to have to report continuously the most successful results.

* See p. 606.

THE DRAUGHTSMANSHIP OF THE SUN.

EVERY architect and every engineer is aware of his obligations to the drawing-board. The use of square and compass in the art of design is the very alphabet of their professions; and those of our readers who are best aware of the hoary antiquity of this method of delineation, and of the royal and patriarchal names which are inscribed in the unwritten record of masonry, do not need to be reminded that what is now a simple matter of education was once a sacred mystery of a high order. Without, however, going back so far as the ark or the pyramids, we may speak of all structural work as being in the first instance put into form by the draughtsman. With the increase of skill and of artistic taste in the production of original drawings, the claim of the architect to take a high rank in his profession becomes more successful. With the elaboration of detail on paper, not only does the certitude of æsthetic effect in the finished work become more attainable, but the probable cost is more readily ascertained. The only drawback is the large expense of making a sufficient number of copies of detailed and elaborate working drawings.

It is in this particular that the photographic process to which we shall presently refer becomes so highly interesting to the architect. Three complete sets of drawings are desirable in almost any instance, and more numerous copies of all or of some of those originals are often desirable. The expense of making these copies is exactly proportioned to their number. By the use of tracing paper and cloth, errors of transcription may be avoided, at the expense of delicacy and durability, and also with a saving of time. Still the cost of tracings, when their use is admissible, is not to be despised, and careful collation with the original is necessary in every instance.

In drawings requiring multiplied copies, as in the case of Parliamentary plans, Ordnance surveys, county maps, and the like, the aid of the printing-press has been found indispensable. But the great expense of engraving is such as to limit the employment of the copper plate to comparatively few cases of draughtsmanship. And, both in engraving and lithography, re-drawing in some mode, whether by tracing or by transfer, is requisite. Thus an element of uncertainty is introduced, which prevents the copy from being, *ipso facto*, a *fac-simile*; nor is either of these methods of reproduction admissible, as matter of cost, unless in cases where a considerable number of copies are known to be required.

If, on the other hand, the architect were put in possession of a simple, accurate, and cheap method of producing *fac-simile* copies of his drawings, or copies on reduced or enlarged scale which should be accurately true to that scale, he would soon learn to avail himself of such an aid. It is precisely this which the process called heliotypy does for the draughtsman. The cost of producing, from the original drawing, a matrix from which to print any number of copies, is so small that, for any design involving detail, it would be easier to make a single copy by the heliotypic process than by hand in the ordinary way. And the production of half a dozen more copies would only cost the paper, ink, and a minute portion of workman's time in addition to the expense of the first. The scale should, of course, be not merely referred to or written, but drawn on the original; and thus, in the case of reduced or enlarged copies, the scale would be enlarged or reduced by the same process that reproduced the drawing itself.

The drawing produced by the heliotype differs from any other copies that can be made at the present time, in possessing the combined characteristics of being incapable of error, and printed in ordinary ink. It is not necessary to discuss the absolute durability of other photographic processes. With regard to the prints with which we have long been familiar, which are produced by the chemical agency of the salts of silver and other metals, it is admitted by their warmest admirers that their absolute permanency is more than dubious. By the use of a large proportion of gold, and by the application of long and costly manipulation to each individual print, a considerable degree of permanence can be obtained. Still, this is far from absolute; and there is not only the question of cost, but that of the inability of the ordinary purchaser to decide whether what he buys is one of those elaborated works, or a more fading product of ordinary manufacture.

Touching the processes, other than the

heliotype, which are called permanent, and with specimens of which our readers are, no doubt, more or less familiar—namely, the autotype and the Woodbury type, they can hardly be regarded as competitors for the employment which we now suggest. That they are unfading, in the strict sense of the word, we do not question. Exposure to light has no influence in obliterating them, as they contain, or may contain, non-metallic pigments, such as carbon. The effect of damp is more doubtful. But it is unnecessary to discuss a subject on which there are conflicting opinions, as it is immaterial from our present point of view. The Woodbury-type is not suited for lineal reproduction. Every part of the paper submitted to the press in this process must be tinted, however slightly, with the ink. So absolutely is this the case, that no margin can be left, and, to ensure one, every Woodbury-type has to be mounted. Again, in the carbon process, as much labour and art is requisite to produce every individual print (with a large percentage to be added for accidents) as is needed to produce the matrix of the heliotype. As matter of art, therefore, to say nothing of absolute reliability, which can hardly be ascribed where a gelatine vehicle is made use of, there is really no competition between these two methods. Neither will any mode of transfer by means of stone, insure the sharp fine lines producible by the heliotype.

Another advantage, of unusual weight, which the heliotypic process possesses over every other form of printing is the small cost and small stowage that are required for securing all the facilities of stereotype. When the gelatine film used as a matrix is once dried, an operation that takes from twenty-four to thirty hours, at a temperature of 90°, it is as durable and convenient to handle or to stow away as a piece of leather or of horn. One, six, a hundred, or any other number of prints can be pulled from the gelatine plate; and the tablet can then be laid aside, serving at once as a permanent record and as a matrix from which, at any future time, a fresh set of impressions can be taken. This property is unique, and its great commercial importance will be readily recognised by all those who are familiar with printing.

As briefly as possible we will now attempt to give an idea of the nature of the heliotype process. The prints ordinarily known as photographs owe their existence to the chemical action of light in dissolving certain salts of metals, notably the nitrate of silver, and in precipitating the metal on the paper. The three processes of the autotype, the Woodbury-type, and the heliotype depend on the effect of light, in rendering certain compound substances, chiefly of organic origin, insoluble in water. Striking as the paradox may seem, that photography is not the action of light, it is nevertheless true that it is not the luminous rays of the spectrum, but the invisible chemical rays that accompany and overlap the blue rays, that alone appear to have any influence in these subtle changes. In the autotype and the Woodbury-type, light, transmitted through an ordinary glass negative, on to a film of gelatine, renders the exposed portions insoluble. The unchanged parts of the film are then washed away, and the result is a sort of model, or picture in low relief. In the autotype, a coloured pigment is combined with the gelatine, and the actual relief above described is transferred to paper, and forms the print. In the Woodbury type, the gelatine mould is made use of for the formation, by hydraulic pressure, of a metal counterpart (as in the case of nature printing), from which impressions are subsequently taken in gelatinous ink. In the heliotype the gelatine is exposed to the action, both of bichromate of potash and of chrome alum. A leathery texture is thus produced, together with a degree of sensitiveness to light, which renders the film, when exposed to its action under a negative, insoluble in, but not entirely insensible to, water. The parts most freely acted on by the actinic rays become thoroughly water-proofed. The half tones and shadows are rendered partially impermeable, but retain the power of absorbing amounts of water proportionate to their degree of exposure. Hence results a picture, invisible by itself, but which becomes immediately conspicuous on the application of a greasy ink, which adheres to the dry gelatine, but is rejected by the damp portions, as in the case of a lithographic stone. From this inked surface the pigment is removed on to paper, by the use of an ordinary Albion press, and this impression is the heliotype plate.

An obstacle to the practical use of this elegant process was found to occur from the unequal inkability—to coin a word—of the gelatine matrix. A thick ink would adhere to the darker portions of the film, leaving the lighter parts uncoloured. The reverse took place with a lighter or more fluid ink. This very peculiarity was grasped by the fertile genius of Mr. Edwards, and converted into one of the distinctive beauties of his process. He uses two inks, applied by successive rollers. These inks may, if required, be of different colours; so that it is not necessary that a heliotype should be a monochrome.

TO, AT, AND FROM BERLIN.*

In my last week's account of the triumphal entry of the troops, I omitted to mention the singular "standards" carried in the procession. These are in form like a Latin cross. From the extremity of each arm hangs a "horsetail," or large tassel of horsehair, in colour varying with the nationality, or regiment, to which the standard belongs, being one white and the other red, or white and black, or red and black. Tolerably large bells are suspended beneath the transverse beam, and an eagle surmounts the whole. To assist the bearer in supporting this edifice, a broad white belt passes round his waist having a loop or pocket in front in which the pole-end of the standard rests. Numerous military bands headed their regiments, the bandmaster marching in front, bearing his very handsome staff, of large size, and covered with crimson and gold. The music of these bands, it is needless to say, is most excellent: it is, like the marching, somewhat rapidly executed, bold and invigorating. As the regiments advanced, and the music grew louder from diminution of distance, then died away as it neared the Schloss Platz, and was drowned by that of the next approaching band, the effect was admirable and very exciting.

The march past terminated a little after four o'clock; and then began the return of the stream of people that had been flowing *out* through the Brandenburg Gate for so many hours in the early morning. Now the faces were all directed the other way, which gave one an odd sensation, just as if the Linden and its houses had been turned round during the day. Since our early breakfast there had been too much occupation for eyes and thoughts to allow us to think of eating; therefore when, after nine hours' hiatus, the dinner-bell sounded, a little before five o'clock, food was extremely acceptable. The *table-d'hôte* was crowded with officers in their gay uniforms, and ladies in pretty toilettes, and a very Babel of voices rose up on all sides. Some few *brassards* were visible. For the information of those persons who have never seen a *brassard*, I may as well say that the one I examined was made of a strip of coarse white linen, about 5 in. wide, machine-stitched at both edges, and a cross of red cloth all in one piece, and about 3 in. in diameter, machine-stitched on to the white.

The extreme ceremony used between the aforesaid officers, and the respectful, almost servile, deference shown to superior military,—even when the two colloquists are evidently of equal civil,—rank, is a peculiar feature: part of the marvellous subordination and organisation, I presume, which so materially contributed towards the attainment of the recent successes. Like almost all other nations, excepting the English, Germans are not great at "shaking hands;" so they clasp their own two instead, and, allowing them to hang down before them, they fidget for a few moments from side to side, bowing all the time, smiling graciously, and uttering polite nothings. At table, champagne in ice was in immense request, and the friendly *klingklang* of glasses was very pleasant to witness, and quite inspiring to hear. Opposite to us sat a lady-nurse, with her little bit of "decoration" ribbon pinned on the bosom of her brown silk dress. I longed to have a talk with her, and had just made a commencement when she unfortunately spilled some *potage* on the aforesaid brown dress, and became absorbed in the removal of the stain. Ere the little trouble was rectified, a fellow-countryman sat down beside her, and, pointing to the "decoration," began an eager conversation; so my chance was gone. She was by no means young, but suggestive, having a gentle, subdued, care-worn expression of countenance.

To our right, a touching little episode occurred, later on. A youngish officer, with a charming wife, sat amongst a circle of brother-officers and relations, grouped on both sides of the table. When the dinner was half over, many of the military men throughout the *speisesaal* had to leave, possibly to return with their regiments to St. Denis, or some other distant "quarters." Our officer rose to depart, which was too much trial for his dear wife, and a flood of tears was the consequence. A nice old grey-haired man beside her essayed to comfort her, but in vain. Presently some few of the absentees returned, when she wistfully gazed round a projecting angle of the room, in hopes her One might come back also; but he came not, and the rebellious tears again began to flow.

In the late afternoon, or early evening, carriages were in great request for driving about to see the decorations; but when the illuminations were being lighted up, and afterwards, no vehicles were allowed to circulate,—which was a wise precaution, for it spared all crushing and inconvenience to the orderly, good-tempered, and well-behaved crowd. There must have been many, many miles of green garland hung up in Berlin, and where the fingers came from to make them is a marvel; as likewise the materials of which the long green ropes were composed, although Belgium and Italy were laid under requisition as well as Germany. Everything capable of being twisted into a wreath fetched enormous prices, I hear: the garlands and wreaths, already made, were brought in from country districts by the wagon-load.

The illuminations were not very remarkable: not nearly so attractive as those put up in London on much more ordinary occasions; and when one remembers the superb demonstrations both in the way of fireworks and illuminations which England produced at the time of the Peace rejoicings after the Crimean war, one cannot but feel that in this line, as in a few others I could mention, *there are some things* we English can do as well as, if not better than, most nations, notwithstanding all the self-inflicted fault-finding we so delight to heap upon our own devoted heads. The electric light on the Brandenburg Gate was a very mild affair; and of the four pots of fire, only three generally—and occasionally two—condescended to burn at the same time. Red, blue, and green fire was lighted on the adjoining house, and was a more successful display, richly illumining the large statues by which it is surmounted. Gas was mostly used for the houses, in stars—some of them very novel in design,—letters, and so forth. But the most effective arrangement with gas is, I think, to trace out all the architectural features of a façade with a line of gas jets. The beautiful screens of cut-glass pendents, with gas behind, so richly used in England, obtain but little at Berlin, but where they did appear they were very effective; and the old-fashioned coloured oil-lamps were charming and tender, as they are always, though so subdued in brilliancy. Of all abominations, the huge flares of gas surrounding the tall standards on each side of the Linden-avenue were the worst, for they utterly eclipsed the more elegant and refined private illuminations. The *Progamm der Feierlichkeiten*, under the head "*Die Illumination*," says that the Schloss would have its 500 windows lighted up by eight wax candles in each window, and all its chandeliers similarly filled, together with the burning of Bengal lights on the cupola; this row of candles in windows sounds very simple, but the effect is excellent, therefore its simplicity is an additional recommendation.

The noble memorial to Frederick the Great, in addition to the flowering plants already mentioned, is surrounded by beautiful arrangements of crown-and-iron-cross shapes, of coloured lamps, which, when lighted up, had a charming appearance; but the palaces and most of the houses are overdone with decoration, the palace of the Crown Prince in particular. The whole façade is a mass of flags, chalky-coloured shields, each bearing the name and date of a victory gained in the late war with frequent mention of the troops engaged, coloured lamps, gas-flares, Chinese lamps, flags, and cannon; and all dedicated to the *dritte armee-corps*. The amount of bunting displayed is almost as astounding as the miles of garlands; the flags are of enormous size: one, suspended from an upper window, that we measured with our eye being at least 12 ft. long. The *German* colours are, as I have said, black, white, and scarlet; they are not placed parallel with the flag-staff, but are "horizontal colours," as the term is. Profiting by the suggestion of a courteous officer, that if we wished

* See pp. 540, 560, 580, *ante*.

to form a correct idea of the captured cannon (*eroberten* is the word, which looks and sounds uncommonly like "robbed"), we should go to the arsenal, we accordingly paid it a visit. This building, the Zeughaus, is generally spoken of as a very perfect specimen of architecture, but to our eyes the huge size of the sculptured ornamentation utterly disfigures it; gigantic gaping helmets, with other armour, form the keystone of the window arches on the exterior of the edifice; while on those surrounding the inner court large heads, carved by Schlüter, represent the human face in every imaginable contortion of agony and death. The Zeughaus contains many interesting relics, such as seven bunches of keys taken from captured fortresses, examples of arms and accoutrements of all European nations, every description of fire-arm from the invention of gunpowder until the present time, the key of Adrianople and a Turkish standard, and several hundred stands of colours dating from the French Revolution, and captured in Paris, 1815. But the greatest interest naturally centres in the guns taken during the late war; of these there is, indeed, a large number, and they are of great size. A peculiar one, short and thick, came from Fort Issy; some were cast in 1776, and are inscribed "1re République;" some are of Louis XVI.'s time, and are engraved with the two L's crossed; one gun, with very ornamental handles, has the royal monogram imperfectly obliterated; a fellow to it still bears the monogram; eighteen of these long guns were all taken at Metz, according to a young soldier who was present. Of three short guns, all similar, one is dated 1851, and has beneath, R. F. (République Française). *The* iron gun from Fort Valérien is here with some ammunition belonging to it. This was the only trophy brought away from the terrible fort: "and enough, too," said a gentleman present; "those who brought it could not have desired anything more to carry for a long time." It is a huge monster, and its rusty exterior is by no means attractive. Some much-ornamented long guns, brought from Fort Vanves, are dated 1748. Amongst the mitrailleuses are several of the old pattern: eight barrels only, and those separate, without an outside casing. Some of the guns taken at Neu Breisach are dated 1733; and two iron embrasure-guns are marked "Sir F. G. Armstrong." The fearful manner in which many of the cannon are knocked about by the German shot and shell is perfectly marvellous. Sometimes a ball has carried away a thick lump from the rimmed mouth of the gun, and then striking along the barrel has dug a deep groove as it went; sometimes a large hollow is ploughed into the immensely thick metal, the force of the blow appearing to have produced heat by which the gun-metal has been partially fused; and then again, the handles of the gun, nearly as thick as a man's wrist, are bent and twisted out of all shape, or are occasionally shot clean away. After seeing these, we drove down the Wilhelm-strasse to have a look at Prince Bismarck's house; also General von Roon's and von Moltke's; the latter is in a barren, recently laid out, part of the Thiergarten.

An interesting collection of objects in the Monbijou Palace has recently been opened to the public, forming a small historical museum. The following items seem especially deserving of notice:—A picture painted by Charles Vernet in 1822, "The Consecration of the Flags of the Allies on the Champs de Mars, at Paris, in 1814." Frederick William III. was king. "Blücher was not there; he was ill with his eyes," said our guide. A picture of the Linden at the end of the eighteenth century shows Berlin an unpretending countrified sort of place. "A Parade unter-den-Linden, 1819," by Schrader, is also interesting from the same cause. A portrait of the first General von Ziethen (*quære:* was it he who organised the Ziethen Hussars, of whose brave deeds we read during the late war, and who wear that wondrous scarlet uniform?) and three other portraits, that of Fürst Blücher, General Bülow v. Dennewitz, and General v. Scharnhorst, interested us likewise.

A wine-glass of Frederick I., father of Frederick the Great, is carefully preserved here. It is of Venetian glass, with his crown and monogram in gold and red, and has a straw stem, with white twisted threads inside. A saddle, said to be 800 years old, covered all over with carved figures in ivory, nailed on, is very curious. A schwert-brecher is a singular-shaped shield, with narrow bars, in rings, fastened on so as to catch the point of the sword, when the wearer, by turning the shield sideways, can snap the sword in half. There are two of these shields. Iron masks, for condemned criminals to wear on their way to execution, hideous caricatures of the faces of animals, demons, &c., suggest the reflection, "See how these Christians loved one another." There are eight drawings of soldiers, by Professor Carl Schultz, with very thick soles to their boots, corrected by the hand of Frederick William III.; a suit of clothes worn by him as a small child; a glove and riding-hat worn by Queen Louise; dress and insignia of a Doctor of Oxford, conferred on Frederick William III., in 1814-15; the crimson velvet-covered chair, sitting in which Frederick William II. died, and a garden-carriage of his period; roughly-executed portraits of Frederick William I.'s tall grenadiers, of whom James Kirkland, an Irishman, was the tallest, best-looking, and most expensive. He was 6 ft. 8 in. high, and he cost 7,000 thalers. Many of the garden-carriages preserved here are curious concerns. Several of them are in the form of animals, the back left open for the riders to sit inside,—one of a dragon, for instance, and the servant has a seat behind on the tail. These reminded me of the hideous water-jugs I saw in Mortlock's window a few months since, (and was much surprised to see such a specimen of bad taste there), which were in the form of feather-covered ducks and swans. What can be more disgusting than the notion of taking a liquid that should be so pure and stainless, out of the hollowed-out body of a bird? A war-sleigh, of the time of the great Kurfürst, used in 1678 and 1779, during the expulsion of the Swedes from Prussia, is a curious and interesting memorial. The handsome robes worn at the coronation in Königsberg, 1861, of crimson velvet, and wondrously fine ermine, are preserved here with the two thrones, footstools, &c., used on the occasion. In the large room are to be seen the chair in which King Frederick William I. died; the stone sink in which he washed his hands at Schloss Wusterhausen; the leather purse used by Frederick II., during the seven years' war; a book, half burnt, which Frederick the Great was reading in bed when he fell asleep, and set himself on fire; some music composed and written down by himself; the cradle he slept in as a baby, and a very large cradle too; a wax cast of his face taken after death, with large, wide-open blue eyes, and nose all snuffy, as it was in life; also casts of his well-formed hands, but which painfully resemble those of a corpse, looking rigid and colourless; and his last favourite horse (stuffed), which lived more than twenty years after his master, though no one was allowed to ride it evermore; it was upwards of forty years old when it died, and looks such a poor, pitiful, worn-out old misery.

There is a wax model of Frederick as a child of about two years old, a pretty little creature, with large blue eyes; also the head in wax of the beautiful Queen Louise, as she died. It has on a lace cap, and lies sideways on the pillow, looking very sweet, and so natural. She was only thirty-two. Her little son is here beside her. In another division of the apartment is a painting on panel, by Von Criewick, dated 1648, of the great Kurfürsten, with his first wife, Louise von Oranien, and his mother: very careful in detail and minute in execution.

The historical "Gobelins" displayed on the walls have a special interest of their own, apart from the events they commemorate, for they were made in Berlin. The subjects of them are,—"The Landing on Rugen, 1678;" "The Seige of Stralsund, 1678;" "Passage of the Army over the frozen Curische Haff, 1679;" "Siege of Stettin, 1677;" "Surrender of Wolgast, 1675;" and "The Battle of Fehrbellin, June 18, 1675." The history of the Berlin tapestry manufactory was as follows:—

In 1686, the Brandenburg resident at Rome, Winkel, recommended a refugee, named Pierre Mercier, to the Kurfürst, who accordingly sent over for him from Amsterdam, to come and give a specimen of his art. Mercier executed a portrait of his new master on horseback, and also his coat of arms, with which the Kurfürst was so well pleased that he desired his historical painter henceforth to occupy himself with this interesting art. Other artists were also summoned to give their assistance, namely, Rütger v. Langerfeld, born in Nimwegen, 1635, who was instructor in mathematics to the young prince, and was also known as an architect; he died 1693; the brothers Casteel, from Brabant, who came 1688, and one of whom died 1694; and Cornelius Bega, born in Holland, 1650, who was called from the Hague to Berlin, 1688: he died June 11, 1693. The manufacture was carried on with great secrecy behind walled-up windows, and thrice changed its locality, until it came, in 1720, into the hands of Carl Vignes, of whose work the tapestries in Monbijou Palace are examples. Very fine specimens in silk, wool, gold, and silver were produced during his superintendence.

The green and pleasant, though small, grounds of Monbijou, filled with large trees, are always open to the public. This wise provision of breathing-places for the people in all the German towns, the ground being frequently laid out as charming gardens, is a peculiar feature, and an admirable one. The national love of *grsenery* is very remarkable; the *cafés* in Berlin have a large slip of the wide pathway before them, partitioned off by a wire or wooden trellis breast high, over which is trained some climbing plant, usually ivy; and behind this slight but leafy screen the frequenters sit sipping coffee or discussing ices, near enough to be enlivened by the bustle and movement of the thoroughfare, but sufficiently removed to feel privacy and ease. The English mode of living in detached houses is beginning to obtain greatly in and around Berlin, and some other large towns. Several delightful residences, each standing in a well-laid-out garden-plot, are seen on all sides. Stucco is being gradually discarded for the more honest brick. We saw much most excellent brickwork; and ornamentation in baked clay, or terra-cotta, is largely used. This is called "the modern style."

The Jews' Synagogue is worth a visit, being richly adorned with marbles, painting, and gilding. The interior of the Opera House we were unable to see. A special performance had been commanded in commemoration of, and suitable to, the occasion, about which we could only learn that all the seats were retained by the Emperor, for his guests, his generals, and so forth. In default of the Opera, we went to the Concert-house, and heard some good singing by the royal cathedral choir. The same evening the troops were entertained at grand dinners given by the city or by private persons; and on Sunday morning a solemn thanksgiving service was held in the Cathedral, at which the Emperor and his Court, his visitors, the military heroes, and as many ordinary individuals as could possibly squeeze within the doors, were present. We essayed to enter, but though we arrived half an hour before the appointed time, we were assured that the building was so *fürchterlich voll* that no one more could get in; so we desisted, and went instead to the English service held in a room of the Monbijou Palace. During the Litany, we were startled by the report of several large cannon close at hand. We subsequently learned that these cannon, 101 in number, were fired off at the conclusion of the "Te Deum;" immediately afterwards the Emperor quitted Berlin, and the grand Triumphal Festival was at an end, —henceforth a thing of the past,—a memory! *

R. F. H.

ON THE USE OF PORTLAND CEMENT CONCRETE AS A BUILDING MATERIAL.†

This subject has for several years awakened a considerable amount of interest, and provoked much inquiry and discussion. This is owing partly to the novelty of the material and partly to the statements made in its favour by some of its advocates. These statements are some of them just, and capable of clearest proof; others are not borne out by experience; and fairness and candour demand that they should be disproved, and the public and the profession put in possession of the truth concerning them.

I propose to examine some of the chief of these in the order of their importance hereafter. Before doing so, I may be permitted, by way of preface, to say that all my remarks have reference to Portland cement concrete, built in continuous layers in what has been called the monolithic system, with such machines or frames as those patented by Tall, Drake, and others. Roman cement for concrete walls is out of the field, and concrete blocks are neither better nor cheaper than ordinary brickwork.

The use of lime concrete dates from very early times, and its value has never been questioned. The introduction of cement concrete as a substitute for stone and brick, with far greater pre-

* To be continued.

† By Mr. Thomas H. Wonnscott. We noticed this paper at the time it was read at the Institute of Architects, and printed some correspondence on the subject afterwards.

tensions to usefulness, is of very recent date, and in a diminutive way may be said to mark an era in the history of construction. Though quite of modern origin, it has already won for itself almost universal acknowledgment as a valuable building material. This, I think, is a point that needs no discussion. The points in connexion with it which do call for examination are—whether it should supersede brick and stone, and whether it is universally applicable with safety, profit, and economy. As it has been my duty to employ it frequently in works varying in cost from 100*l.* to 4,000*l.* or 5,000*l.*, I have had opportunities of testing its qualities, and my convictions having assumed a somewhat definite shape, I venture to express them with an approach to confidence. I have no hesitation in saying that the general impression of its value is in the main correct. By severe tests, its claim to adoption has been fully established.

But approval must not be unqualified. It has its drawbacks and defects, as well as merits, and these should in fairness be shown. Influenced by a knowledge of these, I would not advocate its universal or even large adoption, and would deprecate its use for many purposes suggested by pamphlets I have read on this subject. It is also to a great extent incapable of artistic treatment, except at great cost for moulds, patterns, &c.; and for these reasons, and others hereafter mentioned, I am persuaded neither brick nor stone has anything to fear from competition with it. Its claims to superiority, as stated by its advocates, are chiefly the following:—First, much greater strength than brick or stonework in mortar; second, less cost; third, superior weather-proof and water-proof qualities; fourth, that it is a non-conductor of heat and sound; fifth, that it can be constructed with safety more rapidly than work in mortar; sixth, that it requires no external facing, and only one coat of plaster internally; that chimneys require no pargetting; that bond timbers, lintels, and bressummers may be dispensed with; and that roofs, gutters, and stack-pipes may be constructed wholly of this material.

These are the demands made on our credulity by those who advocate its general introduction. If proved to be just and true, they would lead to a revolution in our art, but they are not yet all established beyond controversy, and I venture to believe they never will be. Before examining these claims in detail, I may be permitted to offer some suggestions on the preparation of the concrete. The proportions that have been found to make the strongest work are six of clean gravel or ballast, broken bricks and flints; one of sand, and one of Portland cement. The sand, I think, adds to the ultimate though not immediate strength, by multiplying points of contact and giving a better bed for each stone of the aggregate, and is especially necessary if the gravel is large. When thus composed, it is not unlike a stone wall, built with one of sand to one of cement, in random courses. The gravel or bricks forming the aggregate should pass through a ¾-in. mesh. Smooth, non-absorbent stones, as chalk flints, are not so good as those that are somewhat porous and rough on the surface. This is accounted for by the fact that the process of "setting" in the cement is partly mechanical and partly chemical; the mechanical part of the process demanding some pores into which to penetrate, or some roughnesses to grasp. Large stones and brick-bats may be advantageously used as "packing,"—that is, they may be "packed" or pressed into the mass while in a semi-fluid state, and if thoroughly surrounded by the concrete, will lessen the cost without diminishing the strength.

It may appear strange, but I have not found a larger proportion of cement than one in eight increase the strength of the concrete. On the contrary, it appears to diminish it. I was accustomed to specify for piers, arches, lintels, &c., one of cement to five of gravel or bricks, but I have abandoned the custom, finding it useless. Why the larger proportion of cement should make weaker work, I am unable to explain. For ordinary walling I have found one in ten sufficiently strong. Mr. Reed, in his work on concrete, says that twenty to one has been used for engineering works at Copenhagen, and I was once informed by an experimenter that he had gradually lessened the proportion of cement to one in twenty-four, and found it then make fairly strong work. But in such a case the conditions must have been exceptionally favourable, and the dispersion of the cement among the mass perfect. As a rule, I should fear to recommend a less proportion than one in ten.

Before using the cement, it is desirable to ascertain its age. It should never be used less than a month old, and if so new as this, should be exposed to the air on a dry floor for four or more days, and occasionally turned over. If this is not done, it sets too rapidly, much to the delight of the inexperienced; a delight I need hardly say considerably modified on the appearance of fire-cracks and fissures a few days after.

It is absolutely essential that every cargo or load of cement should be properly tested. Work built with bad cement is no better than a mud wall. The tests usually applied are threefold. Weight, size, and tensile strength. The weight should be not less than 110 lb. per bushel. In size it should pass through a No. 50 gauge sieve, leaving not more than 10 per cent. residue. Its tensile strength, after seven days' setting under water, should not be less than 200 lb. per square inch. Some cements will bear twice that amount of strain. A much more simple method of ascertaining its quality is given by Mr. Reid, and one that has the advantage of giving its results in twenty-four hours. He says,—"Make up two circular cakes of neat cement 6 in. in diameter and ¼ in. thick, with the smallest quantity of water. When they are sufficiently set to permit removal from the board on which they are mixed, put one of them into water and the other in the open air. After twenty-four hours' immersion examine the water-cake, and if there are no indications on its surface of cracks or fissures, it may be considered free from excess of lime and thoroughly hydraulic. The cake in the open air should be light grey in colour. If it looks yellow and ochrey, the cement contains too much clay, and is deficient in tensile strength. If the water-cake cracks, and the air-cake is of a whitish grey, the cement is worthless, and should at once be removed from the premises.

I have never known of but one case of failure in works under my supervision. This was owing to the inferior quality of the cement, and was discovered and corrected before the walls were above the ground-floor line. The merchant had guaranteed the quality, but I learned that nothing should be taken on trust. Equally with bad cement, loam or clay in the gravel or sand is fatal to stability. In mixing the cement and gravel, the mass should be turned over twice dry and twice with water, which should be poured on through a perforated hose like a water-pot.

I will now speak briefly of the claims of cement concrete to superiority, of which mention has been made before.

First,—That it is stronger than brick or stonework in mortar. This is probably true of the first hundred years of the existence of each material. It is undeniably true of the first twenty years. I need scarcely say anything, I think, to prove this. I venture, however, to cite a few illustrations in support of it. We are all probably familiar with an engraving, in which a gentleman is represented as standing on a beam, a considerable height from the ground, inserted into a small pier, said in the description annexed to the engraving to be a cement concrete wall eleven days old. This picture is a sort of hieroglyphic; interpreted into English, it reads thus:—"This cement concrete wall is immensely stronger than a new brick or stone wall, and I am risking my neck to prove it."

This was no doubt considered proof positive by the gentleman who ventured, and by those who saw him. Strong arms and sledge-hammers have also been employed to drive conviction home to sceptical minds. I was once present when a quick wall was being operated on by a pickaxe, and my astonishment was great to see how little impression was made by each blow. It appeared as firm and strong as a solid block of stone. On another occasion a concrete wall 47 ft. long, 12 in. thick, 10 ft. high, was exposed to the fury of a great storm for some time in a very open position. It was without support, except a cross wall at one end, and a small return at the other. I visited the building after the storm, and met my client and the builder there. We had all come prepared to find the wall demolished, but it was perfectly uninjured.

At another time a wall, 16 ft. high, 18 ft. long, 9 in. thick, withstood on a hill the fury of a storm that blew down a 9-in. brick wall in a less exposed position. At Fernlands, near Chertsey, in a house wholly constructed of concrete, it was thought desirable to cut a doorway through one of the walls shortly after it was built. The opening was dug out with a pickaxe, leaving a straight beam across the centre, 3 ft. 3 in. long, 9 in. deep, and 9 in. thick. There was no hoop iron bond in this beam, but along the centre ran one of the joints between the layers, well known to be the weakest part of these walls. This beam was loaded in the centre with more than a ton; the foreman then leaped on the weight, but the jar produced no effect, and it had ultimately to be dug down with a pick-axe like the rest. The cement in the centre of this beam had but very imperfectly set at the time of its demolition. Illustrations of this nature might be multiplied, but are unnecessary.

The much greater initial energy in setting which cement has, as compared with lime, gives it this advantage, that a cement wall may be built with great rapidity, and loaded at once without danger, such a wall being as firm in seven days as a mortar one in as many months, or even years.

But there are three characteristics, or qualities of cement work, which are sometimes found to diminish this strength, especially when the layers are continuous for 20 ft., 30 ft. or 40 ft. They are expansion, contraction, and contortion in setting. That cement contracts slightly in setting is of course well known. This contraction is greatest in those cements that are over-limed or used too fresh. But before contraction it sometimes expands.

In examining a wall 40 ft. long, one day, which had no hoop-iron bond, and was unfettered by abutments, I observed a hair-like fissure running almost from top to bottom. I called the attention of the foreman to it, and made a mental note of it. Some days after I was again on the spot, and on looking for this vent or fissure, was astonished to find scarcely a trace of it visible. My client, who was with me, thought I must have been mistaken, but it opened again afterwards. There had been a change of weather in the interval of my visits. The barometer had, I think, fallen. Possibly this might have had some influence on it.

The contraction of the cement in setting, when it is used too fresh, or when it sets too rapidly, sometimes opens most unsightly fissures, and these appear generally over doors and windows, where cohesion is weakest, by reason of the smaller section of the wall at those parts. The same thing occurs in cement facings on brick walls. At first sight they appear to be "settlements," but they are not caused by subsidences. Close examination of any concrete wall reveals small fissures; but these are not seriously damaging if the mass holds together. Knowing this tendency to fracture, which is sometimes not fully developed till the facing is on the walls, I never build without the usual lintels, and would recommend a prodigal expenditure of hoop-iron bond.

In using blocks of concrete these defects are not so manifest, the process of setting being completed before they are built into the walls. Stress is often laid on the fact that cement concrete walls may be built much thinner than brick or stone. They may be, doubtless; yet I would not advise extreme thinness; for should the cohesion of the cement fail there would be less width of base, and therefore less stability. Where 18 in., 14 in., and 9 in. brickwork would ordinarily be used, 15 in., 12 in., and 8 in. cement concrete may be safely trusted. Contortion is mostly found in composite walls,—that is, walls partly of brick in mortar, and partly of cement, or in brick walls coated with cement. I have it on the most reliable authority that such a wall has been twisted by a cement coating, like an elm board in seasoning.

The next point for consideration is that of cost. This is an important one. In speaking of it I shall take no notice of published estimates. Conclusions drawn from them are most unreliable, few things being more deceptive than figures framed to prove a desirable point. I have found the cost vary very considerably in different localities. In some cases it has been done for 12*s.* per cubic yard, including the cost of apparatus; but this, I feel constrained to say, was when the builder was the apparatus maker. In other cases it has cost as much as 18*s.* per yard, without builder's profit or cost of apparatus. It should be remembered that the concrete and apparatus are not the whole of the cost of these walls. There are many other items which help to swell the final amount, which do not appear in the published estimates. These estimates are most of them misleading,—true, as far as they go, doubtless, but stopping short of what they ought to say. Added to the first cost of concrete, which is usually all that is taken into account in these estimates, I have found in nearly every case 10 per cent. of the whole cost of the building in the form of cost of apparatus. In

some cases this tax has risen to 20 per cent. For hire, unless the builder has been the apparatus-maker, the charge has never been less than about 3½ per cent. the whole cost of the building, and very rapid work is necessary to reduce it so low.

Other items appear in the form of linings, boxings, screeds, close-boarded centres, chimney and flue cores, and outside cement rendering. In one house the ¾-in. and 1-in. rough boarding for screeds, &c., amounted to between 3,000 ft. and 4,000 ft. superficial. Every deviation from a flat surface, whether aperture or projection, demands a core, a box, or linings. All these items combine to raise the average cost of concrete to about 80 per cent. of the cost of plain brickwork; and, taking the whole cost of an ordinary house, the saving is only from 5 to 10 per cent. It may be urged that this estimate is unfair, because it takes no notice of the fact that the same apparatus may be used for 100 or 200 houses; but as it rarely, if ever, happens that the same employer or builder erects so large a number of houses of precisely the same size and shape, it ought not to be taken into account in a general estimate. But if it ought, I should be slow to believe that 100, or even 50 houses, could be constructed with one machine. I have known an apparatus returned to the maker for considerable repairs after only once using, and another very much damaged after twice using; and the fact that one apparatus-maker offers to take back his machines, allowing only 50 per cent. of the original cost, would seem to indicate a fear in his mind that they would not last 100 times. If men would handle them more carefully, the case might be different; but we are bound to take things as they are, and not as they ought to be.

Next in importance, we have to consider its damp-proof qualities. These have been much overstated also. Concrete walls are not found, in practice, to be weather-proof, unless rendered externally in cement; and they are not water-proof unless trowelled to a smooth surface, and kept from extremes of temperatures. By water-proof, I mean suitable for tanks, cisterns, and reservoirs. I should certainly not advise any one to make roof-gutters or rain-water pipes of this material. In these walls it is impossible to be sure that there are no cavities or interstices, especially along the bed of the layers. No amount of ramming will ensure it, or, if it would, the apparatus would not admit of it. An outside coating is also as necessary for basement-walls in contact with the earth as for those above ground.

In passing, I may remark that I have heard complaints of the frittering away of the concrete in chimney-flues, showing it does not withstand the effects of fire. Frost has no influence on it after it has set; but during the process of setting it is affected by it as much as brickwork in mortar, the surface blistering out and scaling off. Walls should therefore be covered up, and work suspended, during severe frost. It gives off its moisture very rapidly, and is generally fit for papering as soon as finished.

As a non-conductor of heat, it may take precedence of brick, but I am not sure of this. As a non-conductor of sound, I cannot speak in its favour, the slightest sounds being distinctly heard through its walls. I can readily believe that it is warmer in winter than brick, because of the less moisture it retains. That it can be rapidly and safely constructed is true. Leaving out of consideration the time necessary to remove and readjust the apparatus, 2 ft. in height per diem may be safely carried up. That it takes less cement externally, and less plastering internally, is altogether contradicted by my experience. Certainly not less in any case is required, and in many cases dubbing out is found necessary before commencing the ordinary rendering; but the interstices and cavities in the concrete give a far better key to the plaster than ordinary brickwork does. Concrete offers great facilities for warming and ventilation. Heated air is readily conveyed through flues formed in the body of the walls, and admitted into the several rooms through the skirtings. The vitiated air is as readily allowed to escape through apertures in or near the ceilings.

Of the machines in use for concrete building I may not now speak particularly. They are fully described in the pamphlets, issued by the several makers. They have, however, one defect which is common to them all, and which, I think, much limits their usefulness. Every apparatus yet constructed is so rigid in its dimensions that it cannot be adapted to any increase or diminution of size; consequently walls are carried up the same thickness from basement to roof, causing a waste of materials and overloading the lower walls. By the introduction of extending plates, which permitted the lengthening of each plate 50 per cent. on the principle of Clark's shutters, I sought some time ago to remedy this defect, and so to adapt the machine as to be able to build a room of any size: for instance, between 12 ft. by 12 ft., and 18 ft. by 18 ft., or between 10 ft. by 10 ft. and 15 ft. by 15 ft., and so on. As it is, every deviation of only an inch or two necessitates clumsy contrivances or new plates. For floors concrete may be used with advantage and economy. It also makes an admirable hearth, scarcely to be distinguished from rubbed York stone.

Pavings should not be less than 4 in. thick. On a well-rammed foundation, and trowelled smooth, it makes a neat and durable floor, easily washed, and vermin proof. For terraces, landings, and stairs, that are not exposed to sun, rain, and frost, it also answers well. But when exposed it cracks, becomes unsightly, and is not durable,—at least, I have not found it so. In arches built of cement there is no thrust so long as the material remains entire and unbroken. Seeing this, it has been recommended to discard the form of the arch, and treat it as a lintel, bressummer, or landing; but knowing its liability to fracture, I fear to do this, and prefer excess of caution to possible failure.

After what has been said it may be asked, is cement concrete to be recommended at all; and if so, in what cases?

I will conclude by replying to the question, and adding to my reply a few suggestions dictated by experience, to those who desire to use it. For first, second, or even third class houses I would not recommend it, but for houses having no intricacies of plan, and no pretension to ornament, especially if bricks are dear, and still more so if the gravel can be dug on the spot, or from the basement of the house, as is sometimes the case, it may be used with advantage. In thick walls this advantage is still more evident. For retaining walls, backing or filling in to ashlar stonework, for cottages, farm-buildings, fence-walls, warehouses, sea-walls, and other buildings that may be made endurable to the eye by cement rendering, I should certainly permit, if I did not recommend its use. On the whole, I look on this as a material to be employed as an exception, and not as a rule. But when it is employed, it is of the utmost importance that the cement be of good quality; that the gravel and sand be perfectly clean; that the cement be thoroughly distributed through the mass; that constant, careful, and trustworthy supervision be exercised to secure correctness of proportions of the ingredients; that hoop-iron bond be used with no sparing hand; that wooden bricks be superseded by slips not more than 1½ in. thick, and in section like a dovetail. Wooden bricks swell with the moisture of the cement, and in shrinking again become loose. Besides this, every wall should be rendered in cement externally, the usual damp course should not be dispensed with, and chimney-flues should be lined with brick, and pargetted in the usual manner. Given these conditions, and a wall in cement concrete may be built, in some respects as good, in others better, and in some others not far inferior to a brick or stone wall in mortar.

I offer these remarks as the results of my own experience, to be confirmed by the experience of others, if they are correct, to be corrected if they err.

PEABODY-SQUARE, BLACKFRIARS-ROAD.

The aspect of the Peabody Buildings in the Blackfriars-road, to which tenants were admitted on the 1st inst., is decidedly superior to that of other establishments erected for the trustees. The buildings are not so lofty, are more spread about, have trees in front of them next the high-road and within the quadrangles, and are altogether more home-like and less barracky. Moreover, and this is of very great consequence, the blocks are not connected, so that the inner areas have more chance of complete ventilation than is the case when they are surrounded on all sides with continuous buildings. Mr. Henry A. Darbishire was the architect, as heretofore; and the work has been executed by Messrs. Wm. Cubitt & Co., which is pretty nearly tantamount to saying that it is very well done. There are sixteen blocks, providing 320 dwellings, some of three rooms each, some of two, and a few one room only, the rent being respectively 5s., 4s., and 2s. 6d. a week. That the new homes meet the views and wants of the surrounding population is shown by the fact that the whole are let, and the applicants still numerous. A lavatory and W.C. are provided for each two or three tenants, as the case may be; and there are laundries where all may take their turn. These and the drying-ground seem scarcely sufficient at present, but wants will doubtless be met as they make themselves felt. The range in living-rooms looks like a useful one. There are a few feet of rail in each room, to which pictures may be hung; and an arrangement for the admittance of air to the bedrooms which have no fireplaces. In fact, it is everywhere evident that pains have been taken to make the place useful and comfortable. An objection has been taken, and not without some reason, to the position of the coal-bunker. It stands under the window in the sitting-room, and was doubtless prompted by the desire to enable the tenants to lay in a tolerable quantity at a time, which means buying at a cheap rate. If the trustees thought fit to provide a stock, and allow the tenants to have it at wholesale price, a small closet for each on the landings would then suffice.

We will merely add that there are a bath for each block of dwellings, and shafts for the dust and refuse, and that the impression that inhabitants cannot go in and out after a certain hour without permission is altogether erroneous. The outer gate is very properly locked at eleven o'clock, when the gas is turned off; but each tenant has a key, and can go in and out when he pleases. According to the very courteous superintendent, Mr. Heath, the freedom of the subject will be in no way interfered with in Peabody-square, Blackfriars-road.

THE WOODEN ARCHITECTURE OF NOVA SCOTIA.

In a country where wood is plentiful, sandstone scarce, and bricks dear, it is not to be wondered at if a people who have not much collective wealth to spend on luxuries, no fine buildings erected in their midst, no ancient ruins planted in their landscapes, and no fine pictures hung on their drawing-room walls, to educate and refine their taste, should build their houses of the cheapest material, and according to designs generally drawn and superintended by themselves.

When wooden architecture is mentioned, Europeans immediately conjure up visions of those quaint old buildings they have often seen in many of their older towns, and picture to themselves the beauty of a modern city composed entirely of such dwellings. But a sail up the magnificent harbour of Halifax, and a look at the wooden wharfs, the unsubstantial wooden warehouses, and the wooden spires of distant churches, is enough to dispel any lingering sentiment that may have been had regarding them. For the wooden houses of Halifax, with few exceptions, are so devoid of architectural taste that, if all the brick and stone ones were taken away, the city would not present such a good appearance as the wooden stables and barns attached to the houses in a large British city, if they were all collected together, and arranged in the form of streets and squares. Notwithstanding this, we have no doubt of being able to make the subject interesting, by exhibiting it in the three phases of construction, style, and the shams connected therewith, showing to the inhabitants of the British isles a style of art that must be entirely new to them.

To a foreigner, a wooden building in course of erection is rather an interesting operation. For, in the first place, although the wooden walls are only 9 in. thick when finished, yet the foundations are built of stone, 2 ft. thick, and sunk 4 ft. below the surface of the ground, in order to be beyond the reach of frost in winter. When the frame arrives from the country (which has been executed according to an extra plan which the architect has to furnish), the different parts are all fitted together and put up in a few days, the whole thing looking like a vast cage. It does not take long to finish the exterior then, for the frame is all boarded over with inch boards, except the openings for doors and windows; and when the frames for the latter are inserted, the architraves and other finish are nailed round them, the cornice and pasteboards are put on, and then the whole of the walls and roofs are

slated with wooden slates called shingles. Yet although the exterior is thus soon completed, the interior requires as much time as a brick-and-stone building, for it is finished exactly similar, so much so, that a stranger taken into one in the evening would never imagine he was in a wooden house.

Although dwellings are thus easily framed and built, yet there is considerable constructive skill sometimes shown in building a wooden church, for an open roof is thrown over a space of 40 ft. or 50 ft., and yet these 9 in. walls, without any buttress, maintain the whole without spreading an inch. A wooden tower and spire, 150 ft. high, also awakens astonishment in a stranger; and well it might, as it is one of the most difficult problems in wooden architecture.

We now come to consider the style of the structures. Until lately they were of the most nondescript kind. Our oldest church in the city was meant to be Classic, but the spire is somewhat Chinese in appearance, and the louvres of the windows are all painted green. Another was after some Grecian model, and has a lofty portico, with massive columns, constructed of dozens of inch-boards. Another was designed by a German after a church in his own country. The form is peculiar, and the original would, no doubt, be beautiful, but the copy is spoilt through ignorance of design and detail. The style was meant to be Romanesque. Some of the churches also are designed in what is meant to be Gothic, the tracery in the windows of which is usually Perpendicular. Classic cornices and details are put on the whole of these buildings alike; while the crockets on the pinnacles of one church have a strong resemblance to rams' horns.

Several churches put up lately evince great improvement in design and detail, and are generally fair specimens of Gothic, considering the material they are built in. The great fault of the old structures was a slimness and want of relief about them that made them look as if the least wind would blow them over. By making the walls thicker, greater depth is now obtained for the windows, the mouldings and details are made bolder, showing more relief, and, generally speaking, the different features are detailed more massively and decidedly, thus giving a more solid look to the whole. While we think the interior of a wooden church will always look better than the exterior, and that there is great room for improvement everywhere, yet in the course of a few years some of our smaller edifices may be not undeserving of a place in some itinerant European's sketch-book.

Our older houses, worse than the churches, were built of no design whatever, and seemed to be put up by the yard. The absurd practice generally prevailed of building them as plain as possible outside, while all the wealth was lavished in furnishing the inside. Still a portico was considered a necessary appendage, supported by a couple of fluted columns, which were generally painted like marble. When the exteriors began to show some design, they were still wrong, for they hankered after a stone construction and solidity, instead of the picturesque bracketing, overlapping, and broken skyline of our Mediæval wooden buildings. In the wealthy little town of Yarmouth, we have a number of the most elaborate wooden houses in the country, built in the solid style, with full suites of rooms, offices, ice-houses, barns and stables, that cost 7,000*l.* and 8,000*l.* sterling, a sum that would have erected the same complete in stone, in Britain. Latterly there has been more attempts at wooden construction and appearance, a greater use of brackets and bargeboards, while the roofs are as much broken up as is consistent with the climate, which is famous for causing leaks. There is no doubt that we may in time be able to rival our Mediæval architects in wood, as we have already done in Gothic architecture in stone, but we hope that it will be accomplished with less slavish copyism and imitation than have accompanied it.

We now come to the shams in wooden architecture; and, as might be expected in this country, they are innumerable. Even some of the very latest churches abound with them; for shell buttresses are thrown against the sides and up the corners of towers and spires, while the walls of the interior are lined and coursed in imitation of stone, showing the horrible construction of a stone interior to a wooden exterior! Sometimes whole fronts are built in pieces to look like stone, and then the whole is painted, and carefully sanded, defying detection in the mere glance of the uninitiated. Wooden cornices and balusters to brick and stone buildings, painted and sanded, are very common. Some of the shams are too absurd. A doorway on a recently-erected house, otherwise finished like an ordinary wooden building, was painted a green and black marble. The effect is outrageous. None of our own painters would ever have thought of doing it. But it shows the taste of our moneyed men when a temptation is thrown in their way, and an opportunity for display is offered them, although it is rather glaring. This was an importation, and the artist was said to be a Scotchman. If so, he was a very degenerate one, and must have been *drawn* through the United States. The most amusing sham we have seen for a long time, however, is on a house in one of our principal streets in Halifax. An entrance was wanted to the platform of the roof, and instead of a mere hatch, the idea occurred to the proprietor of building a sham chimney of wood with a door in it, especially as there was a chimney on the other side of the roof it would correspond with. But the absurdity does not end here, for the the other chimney being brick, this one was not made to resemble that material, but was painted, lined, and coursed in imitation of stone. The whole idea is as absurd as if the occupant of the house, who is a doctor, had, in putting a wooden arm on a negro, made it hollow with a lid in it, so that it would serve as a snuff-box, while he painted and coloured it in imitation of that of a white man.

We have now given a general idea of the state of wooden architecture in the country, and while there does not seem much for congratulation, yet there is appearance of considerable improvement being exhibited, which may produce good fruit in a few years' time. And. Dewar.

Halifax, Nova Scotia.

POPLAR AND STEPNEY SICK ASYLUM.

On Thursday, the 3rd, this asylum, which has been erected under the provisions of the Metropolitan Poor Act (1867) for the accommodation of the sick, bedridden, and infirm of the Poplar and Stepney Poor Law Districts was opened. The land upon which the building stands is a strip of about 4½ acres, opposite the workhouse of the Stepney Union at Bromley-by-Bow, the two buildings being divided by the Tilbury and Southend Railway. The building has been erected upon the pavilion system, and consists of eight separate blocks. In the centre of the front and facing the railway is the administrative block, consisting of the board-room, offices, chapel, officers' quarters, kitchen, stores, &c. Upon each side of this block is a double pavilion and single pavilion, each separated from the block and from each other by a clear space of 70 ft.; completing this range of buildings is a porter's lodge at one end, with receiving wards and separation wards. The whole of these buildings are connected along the front on the ground-floor by a corridor, 10 ft. wide and upwards of 600 ft. long; above this, on the first floor, is a covered way, and upon the second floor an open terrace, both of which afford a communication between the pavilions or separate blocks upon each floor, and so reduce to a minimum the great defect of the pavilion system, viz., the labour of administration. In the rear of the administrative block is the laundry, and in the most retired corner of the ground the stable and dead-house.

The building is entered from Devons-road, Bromley. The materials are brick and Portland stone. The central block includes a tower, containing a large tank for the hot-water warming circulation and supply. This building is faced with malm bricks, and has strings and dressings of Portland stone to the doors, windows, quoins, gables, &c.

The building is certified by the Poor Law Board to contain 572 patients' beds: the bedridden and infirm will be placed in the double pavilions, whilst the acutely sick will occupy the single pavilions. We are glad to hear that the erection of double pavilions did not form part of the architects' original design, but was an alteration suggested by the authorities. They are not advisable. The cubic space allotted to each patient varies from 1,000 ft. to 1,500 ft.

The administrative block contains nearly the whole of the accommodation necessary for the management of the asylum, and surrounds an open court, which affords facilities for lighting and ventilation. On the ground floor is a board-room, 30 ft. by 20 ft., decorated in carton pierre by Bookbinder, and furnished from designs by the architects. The building has been fitted with electric bells by Messrs. Moseley & Co. In the waiting-room has been fixed a bell indicator, and every ward and each principal room or office rings into this room.

In the rear of the administrative block are the various stores. The kitchen, measuring 40 ft. by 25 ft., and the scullery, are also in this part of the building. The cooking appliances include two large roasting and baking ranges, with open fires, and a capacious iron panelled steam cooking apparatus, fixed on the floor in the centre of the kitchen, under the louvre ventilation in the open timbered roof. It has an underground flue to the chimney, and consists of six 50 to 80 gallons steam jacketed boilers and a series of potato-steaming trays. This apparatus was erected by Messrs. Fraser, Brothers, of Bromley-by-Bow.

The first and second floors of this central building contain the resident officers' quarters and nurses' dormitories.

The chapel contains sittings for 110 persons: it has an open-timbered roof of pine, with moulded tie-beams and curved ribs under the principal rafters meeting in a pointed apex, and the spandrels filled in with perforated panels.

The single pavilion has three wards, lighted on each side by eight sash windows. The beds are disposed on either side of each window, making 32 ft. to each ward. The brickwork of the walls is "dinged" in lieu of being plastered, and is coloured with a mauve-grey tint above, and the lower portion painted buff, with chocolate line and skirting. The windows are all fitted with green Venetian blinds. The dimensions of these wards are 117 ft. long, 21 ft. wide, 14 ft. high. The warming is effected by two large ventilating grates to each ward, with air-chambers at back, and terra-cotta blocks and radiators, by means of which, in addition to the direct heat by radiation from the fire, fresh cold air is mildly warmed in the air-chamber, and is diffused in gentle streams into the ward. Fresh air can also be admitted from the windows at the sides, from the bay-windows at the end, from the swing entrance-doors to the staircases, from the large frame of regulating-louvres over these doors, and from Sherringham's ventilators, one of which is placed between each side-window near the ceiling. The foul air is withdrawn by means of a number of separate upcast shafts, built in the chimney-stacks, but separate from, although near to, the smoke-flues, fitted with iron gratings in the wards, and terminating above the roofs with iron louvres, to prevent down-draught. Each shaft is separate from the other, so that the foul air of one ward may not penetrate into the other wards. There are also a number of similar ventilating-shafts built in the end walls. Great care has been taken to provide means to give an upward direction to all fresh-air inlets, so as to prevent draughts, which are the frequent unpleasant consequences of badly-arranged ventilation apparatus. As the questions of warming and ventilation cannot be considered apart, it may be here mentioned that warming by open fire-grates has been considered to be the most healthy, and, with the addition of the air-warming chambers, will no doubt be sufficient to maintain a temperature of 60°. The ceilings and floors are supported by girders, each formed of two rolled-iron I joists, each 9 in. deep, riveted one over the other, the top half of the girder concealed in the thickness of the flooring.

At the free end of each ward is built a bath-room on one side, and water-closets and slop-shoots on the other; these are cut off from the wards by means of intervening lobbies fitted with ventilators and having windows on both sides. The bath-rooms have each a bath on wheels. The water-closets are fitted with Lambert's or Underhay's self-flushing seat action apparatus, and there are provided ranges of white marble slabs with earthenware wash-basins fitted with Finch's anti-vibration self-closing hot and cold water push-valves. Attached to each ward is a room for the nurse, having a window by means of which she can overlook the patients under her charge.

In the laundry building are a receiving-room, three wash-houses, ironing-room, boiler and engine houses, and mess and sleeping rooms for the laundry woman and her assistants. The wash-houses are fitted with McAlpine's dolly-washers and Bradford's rotary washing-machines, patent hydro-extractors in lieu of wringers, steam boiling-tubs, mangles and other necessary appliances, driven by 10-horse power (nominal)

steam engine in basement. In the ironing-room is a large chamber of drying-horses, heated by the iron coke-stove which heats the laundresses' irons. The basement of this building contains a bench of four large Cornish boilers, two of which are for steam, whilst the other two are for the hot-water warming and the hot-water supply respectively throughout the whole building; the whole is thus placed conveniently under the charge of the engineer and his stoker. A fumigator is also provided in the laundry building, but cut off from the wash-houses and with a separate external entrance. In this chamber is fumigated the out-door clothing of the patients before it is stored.

The drainage is of glazed stoneware pipes, from 15 in. to 4 in. in diameter, connected with the new northern low-level sewer.

The building was erected by Mr. Robert Mann, of Kentish-town, whose contract was 30,000*l*. The total cost, with the other contracts for drainage, laying out ground, entrance-gates, boundary-walls and fences, stores, mantelpieces, dead-house and stable fittings, stained chapel windows, gas and water supply, fire-mains, tanks, Venetian blinds, cooking apparatus, laundry machinery, steam-engine and boilers, hot-water apparatus and boilers, lifts, electric bells, speaking-tubes, dispensary fittings, asphalting, &c., was 43,000*l*. The cooking apparatus and laundry machinery were supplied by Messrs. Fraser Brothers, Bromley-by-Bow; hot-water supply and warming apparatus, cold-water supply, and tanks and fire-mains, by Messrs. Jeaks & Co., Great Russell-street; the entrance-gates were cast by McFarlane & Co., Glasgow and London; the chapel windows executed by Mr. Gibbs, Bedford-square; the gas-fitting was by Mr. Fulton, Stepney; the blinds were by Mr. Riddell, Stepney; painting and colouring of wards, &c., Mr. A. Derby, Limehouse; asphalting, Mr. Pilkington, Fish-street-hill; and joinery fittings, by Mr. Sheffield, Poplar. Mr. V. Hibbens was clerk of the works, and Messrs. Arthur & C. Harston, East India-road, London, were the architects.

ALEXANDRA PARK.

A PARTY of some 120 gentlemen, many of them members of the fourth estate, met on the 29th ult. in the Alexandra Palace. An intended walk round the park was prevented by the stormy weather, but few present regretted that they were thus detained to hear the magic music of Mr. Sullivan on the organ. With all that we have heard of music during the past few months, the effect of the *vox angelica*, coming down from the solid roof of the noble building, was a surprise as well as a delight. A very elegant *déjeûner* was arranged in one of the saloons of the building, Sir William Wiseman, bart., one of the executive committee, being in the chair. We should have said no more on a matter chiefly interesting to those who were present, were it not for the remarkable speech of Mr. Lloyd,—*the* Mr. Lloyd, as some people call him. The learned gentleman said that having been professionally consulted as to the formation of the new company, he had become so profoundly impressed with the importance and solidity of the scheme as not only to give his name as a trustee, but to take a most lively interest in the success of the undertaking. To secure the most perfect success, all that was required, in his opinion, was publicity, and that the public should understand the plan.

The long and conscientious detail of the prospectus is too difficult for many people to master in a hurry. The ordinary reader requires to know, in half a dozen lines, what is proposed: let us endeavour to supply this want. Just without the four-mile radius from Charing-cross lies an estate of nearly 500 acres of hill-side land, covered with turf, and studded with fine timber. On this land is built a large exhibition-hall or palace, which is ready for immediate use. The annual growth of London is so rapid that, unless some check is interposed, in fifteen or twenty years' time the whole of this park will be turned into building land, and London will push on, in direct lines of brick and mortar, to Finchley and to Edgware. To preserve this land for public use, a company is now being formed, under the name of the Alexandra Palace Tontine. Every one who takes a guinea share in this company will become a proprietor of the park, and, as such, will have the right to free entrance on Sunday, when none but proprietors will be admitted. On other days, music, sports, exhibitions of fine and industrial art, hawking, and other attractions, will be accessible for a moderate payment. No liability is incurred by the guinea shareholder. No dividend will be paid; but in 1886 the value of the property will be divided among the surviving guinea ticket-holders.

The estate is now purchasable at the price of 675,000 guineas. The land alone is thought worth upwards of 450,000*l*. at the rate of recent sales in the neighbourhood. The Palace and other buildings have, it is stated by the vendors, cost upwards of 400,000*l*. The value of ornamental property in the neighbourhood of London increases with great rapidity. At Sydenham, the Crystal Palace was opened in 1852; the Museum at South Kensington was opened more recently. In each of these cases the value of the ornamental land has multiplied from six to seven fold in fifteen years. The value of the Alexandra Park, in 1886, at this same rate of improvement, will scarcely be less than 5,000*l*. per acre.

The income from admissions will be devoted in the first instance to the maintenance and embellishment of the property, and to providing attractions for the public. The net profit will belong to the certificate-holders. It is proposed to distribute the amount among them every three years by means of Fine-Art Unions.

Thus the holder of a guinea-ticket will have 780 free admissions, five chances of an Art-Union prize (high or low), and a distribution share in 1886, which is estimated at not less than 10*l*. If the nominee on the certificate die before 1886, 1*l*. for each share will be returned by the London and Lancashire Insurance Company to the representative of the nominee. Thus the utmost loss, in any case, to an insured guinea certificate-holder will be one shilling, paid for insurance, and the interest on the guinea. The possible and the probable benefits we have mentioned. Of course, if the Tontine, as the scheme is called, is not filled up, the money will be returned intact.

A NATIONAL THEATRE.

THE committee appointed to consider the practicability of founding a theatre for the production of dramatic works of a high class met on Monday last, discussed at some length the best mode of raising money for the purpose, and adjourned to allow time for the preparation of a programme which might be set forth to test public feeling. The general opinion seemed to be that, whatever shape such an organisation might take (such as a limited company, for the sake of preventing personal responsibility), the expectation of pecuniary profit should not be offered as an inducement to subscribe. The return of money subscribed, if desired, in the event of success, would be but reasonable, but profits, it was thought, should go towards the erection of a complete building hereafter, or for the establishment of retiring pensions for actors. The time of year would probably prevent vigorous proceedings just now; but public opinion might be tested, and if the response proved satisfactory, the scheme could be launched in earnest when people return to town.

As full discussion is desirable, we print the following from one who has a right to be heard on the subject. We do not ourselves find anything in it to discourage those who are interesting themselves in the present movement:—

Sir,—I have read the communication on this subject in the *Builder* of July 15th with much interest. "That there ought to be a National Theatre where dramatic works of the highest class could be constantly produced," I quite agree with Mr. Godwin.

To the mode of effecting this most desirable result I do not, at present, see my way. From any Government that is or is to be no aid can be expected. Even if we had an enlightened Chancellor of the Exchequer,—enlightened, I mean, on the subject of a National Theatre,—can you conceive,—I cannot,—the row there would be from all economists in and out of the House; the still greater row that would proceed from *chapels*, if not from *churches*?

The Prince of Wales's Theatre is cited often as an example that when a manager leads well audiences will follow willingly. No one admires more than I do the excellent performances and plays at that house. But it must not be forgotten that the experiment of good leading and following is there made on a very small basis. The comedies, so deservedly successful, being devoted to English life and manners, may be justly termed *national*, but *quantula pars?*—a nook and corner of English life.

I am in possession of J. Philip Kemble's account-books of his management at Covent Garden, at the end of the last and the beginning—*i.e.*, the first eight or nine years—of the present century. The general rule was at that time to give thrice a week, *i.e.*, on the *on* nights, either a play of Shakspeare's, Massinger's, Southern's, or some other classical dramas; on the *off*-nights, *i.e.*, Tuesday, Thursday, and Saturday, new or not very old plays,—certainly few of them national or classical. The Othello-caste then comprised J. Kemble, C. Kemble, Mrs. Siddons, Miss Brunton or Mrs. Powell, G. F. Cooke, Holman, Barrymore, &c., all more or less famous in their day,—a day when barristers, literary men, and M.P.s occupied the first five rows of the pit, and who constituted a very formidable jury both as regarded authors and actors. With what success? C. Kemble told me, many years after his brother and sister had retired from the world as well as from the stage, that "Othello," for example, was played to houses containing 30*l*. worth of tickets, while "Pizarro" and "Bluebeard" filled the treasury. The *elephants*, in 1807 or thereabout, were an immense success! You know, I have no doubt, George Colman the Younger's tale of Master Daw, the call-boy. I cannot recollect the exact title of the poem (it is in Colman's "Broad Grins"), but Master Daw is the hero of it, and Colman throws some light on the tastes of the British public, and on the catering of managers for their amusement, *e. g.*:—

> "During his time from the proscenium ta'en,
> Thalia and Melpomene both vanish'd:
> Seeming to hint to a capricious age,
> Suffer the quadrupeds to keep the stage,
> The Muses to be banish'd."

As I have not seen the poem for at least thirty years, I may not quote *verbatim*, but this is the gist of his satire.

Again, if you consult that most useful book, Geneste's "History of the Stage," you will see very few traces of a National Theatre even at a time when, to listen to some people, there really was something like one.

Well, it is true that Shakspeare and other sterling dramatic poets were endured in these halcyon days. But how? Doctored by Cibber, by Nahum Tate, John Dryden, &c. Shakspeare, since the Restoration, has rarely been performed *pur et simple*. Edmund Kean, much to his credit, tried to give the real "Lear," but was compelled to fall back on Tate's, in which the old king winds up with a tag from Pope's "Essay on Man," and survives his afflictions, joins *Edgar* and *Cordelia* in holy matrimony, and lives happily ever after, with his pals, *Kent* and *Gloucester!*

Macready played the real "Lear," but failed in his attempt to restore the real "Richard III." J. Kemble retained Dryden's abominable mangle of "The Tempest," and inserted into "Coriolanus" some corroborating scenes from Thomson's ["The Seasons"] tragedy of the same name. I do not know whether he, in "Macbeth," made a dying speech taken out of the second part of "Henry IV.," transplanted by Colley Cibber into "Richard III.," and then put into the mouth of "Great Glamis worthy Cawdor;" but E. Kean certainly wound up the part with "Now shall the world no longer be a stage," &c. These are a very few of the many instances I could bring of the appreciation of the "divine Williams" by his countrymen and admirers. We have much hypocrisy in Britain,—none deeper than our profession of love for Shakspeare.

So, I can discern, neither in the present nor the past age, any reasonable grounds for expecting the public,—"pensive" or not,—to rise to the level of a *National Theatre*. I differ from some of my friends in thinking the fault lies with the actors and actresses in any great degree. Rather do I impute the failure of the stage to the want of organisation in the pieces enacted and the performers in them. I can recollect John Fawcett's,—stage-manager at Covent Garden,—training of his forces. Mr. Macready drilled even the wounded captain in "Macbeth" into good and forcible acting. Very little chance had a performer in his day of going home to his early dinner until he or she had done his bidding. E. Kean, so far as I knew, never interfered. C. Kean was most laborious in his rehearsals: so is Miss Wilton now. But where else is there a rehearsal de-

serving the name, except of tremendous effects,—jumping off a tower, or into a "cheerful blaze?"

For the decline of the stage we have much to thank our aristocracy for. They, with few exceptions, pooh-poohed E. Kean, cold-shouldered Macready, and lately, *i.e.*, within three or four years, gave Mdlle. Schneider a reception that could not have been exceeded in warmth or duration had Her Majesty, after her long retirement, suddenly appeared at the St. James's Theatre.

To have a National Theatre, there must be a national craving for one. Of that I see no symptoms. Mr. Planché does. He has better and wider opportunities of observing than I have, and I heartily hope that I am wrong and that he is right. VETUS.

HALIFAX INFIRMARY COMPETITION.

THE quarterly board of the Infirmary have selected the plans from those competing for the three premiums offered for designs for the new infirmary. Seventeen sets of plans were sent in, from London, Newcastle, Stockton, Bradford, Leeds, Halifax, &c. We understand that the Board intend exhibiting the selected plans and those of the other architects who assent to their exhibition, in one of the public rooms in the town. The Board have awarded the first premium, of 150*l.*, to the plans marked "Æsculapius" (Mr. Bakewell, of Leeds and Halifax). The design is Gothic, and there are six pavilions, each in two stories, and two smaller wards for convalescents. There are to be 217 beds, when the infirmary is fully completed; and at present the portion accommodating eighty-four beds can be built. The total cost per bed is estimated at 150*l.*

The second premium (75*l.*), "Red Cross," is given to Messrs. R. Ives & Son, of this town. This design is also Gothic, on the pavilion principle, having 200 beds, and 20 in the fever wards. At first eighty-six beds could be built. Cost 190*l.* per bed.

Premium three (25*l.*), motto, "Nightingale," goes to Messrs. A. Smith & Co., of London. This design is also Gothic, and can either be built for 210 beds (98 at first) or for 172 beds (80 at first).

THE MOVEMENT IN COVENT GARDEN MARKET.

THE daily press has been engaged in discussing the subject of Covent Garden Market, and the serious differences that have arisen between the Duke of Bedford and his tenants, the salesmen. One recommends the construction of a new market in Leicester-square; another the extension of Farringdon Market, and its adaptation to the business of Covent Garden, at an expense of 150,000*l.*; while a third recommends a compromise to both parties. Strange to say, none of the journals have anything to say about the anomaly of the Duke of Bedford having the only great wholesale vegetable market in the metropolis entirely under his own control. Of what practical value is local self-government when one of its chief duties is left in the hands of a landed monopolist like the noble Duke? Nearly all the large towns of the United Kingdom, and also of the colonies, are well supplied with markets established by the municipal authorities; and these being under the control of an annual election, no difficulty is found in checking any abuses in their management. The answer to all this, as well as to many other short-comings in London, is, that we must wait for that long-promised reform in our local government which seems to recede as we advance, its opponents skilfully buttressing themselves behind many other more powerful social and political monopolies and vested interests.

Every interest except the public interest seems to be over-represented. Well-managed and rich companies who supply gas and water are supported by others who cannot give so good a reason for their existence; livery companies, endowed schools, and close corporations, with all the following of officials, annuitants, contractors, &c., who "live, move, and have their being" under the patronage of these antiquated, effete, and often corrupt institutions, fight with a spirit and determination that often prevail over the common weal, for which they are supposed to exist. To do the City corporation justice, it must be admitted that during the last few years it has shown wonderful activity, and it does not seem at all indisposed to enter into the views of the Covent-garden salesmen. It was not before time that it awoke from the dream of security in which it had so long indulged; and, immediately on the Thames Embankment being placed in the hands of the Metropolitan Board of Works for construction, set about the important and costly works of the Holborn Viaduct, the Smithfield Market, and Blackfriars Bridge. Its hands are, without counting this new project, already pretty full: a new Foreign Cattle-market at Deptford, an extension of Billingsgate and Leadenhall markets, all of which involve the expenditure of much money and skill. So far the public has benefited by the rivalry that exists between the two bodies, and will so long as it does not run to extremes. The City corporation has survived the other close boroughs nearly forty years, although it cannot be said that quiet and peaceable possession has been had; indeed, not a session of Parliament has passed without some open or covert attack upon its privileges. Municipal reformers at one time, the executive at another, have tried to exercise their skill upon it. The City, however, remains entrenched within its ancient fortress of royal charters and franchises, and some recent events show that there is "life in the old dog yet." There is one peculiarity about the City mode of defence: it keeps on good terms with both the ruling parties, and while fending off every blow aimed at itself, is zealous in assisting to reform anything out of its own sphere. With all its faults we should have little to complain of were its boundaries identical with the bills of mortality, or even the four-mile circle; but I fear this or any reform of our vestry-ridden town is a good way off, and must wait the advent of a stronger man than the present Home Minister.

From this digression I now return to Covent Garden. I do not hold with any of the plans proposed to settle it. With the Duke, who has only a life interest, a satisfactory settlement is hardly possible, and, everything duly considered, is not desirable. The fact is the country has outgrown its old suit, and the time has come when changes to be useful should be thorough. The market ought to be public property, the Duke being with all due speed disestablished and disendowed. Every one knows by experience the difficulty of diverting the current of business out of its accustomed channels, and in markets particularly the experience has been nearly uniform. The latest and most conspicuous failure is the Baroness Burdett Coutts's magnificent Columbia Market. The cause is not far to seek,—the custom of localities devoted to this purpose in streets and narrow lanes without much through traffic, such as Clare Market, Leather-lane, Newport, and many other places where people can supply their wants without the sacrifice of much time. The great extent of the metropolis would render it difficult to provide markets within an easy distance of its widespread and populous suburbs, while the central parts are sufficiently accommodated in a way they have gradually become accustomed to. If, therefore, experience is to guide us, it would seem to lead to the conclusion that wholesale markets only can be established with a fair prospect of success, and further to remove these, or to establish new ones, is evidently hazardous. The removal of Newgate to Smithfield was so long foreseen, and the two sites are so near together, as not to form a fair exception. The Metropolitan Cattle Market removed from Smithfield has caused a considerable pecuniary sacrifice to the corporation, and the same may be said of Farringdon.

I come, then, to the conclusion that the great wholesale fruit and vegetable market should remain in its present central site, but not with its present noble proprietor. The Metropolitan Board of Works should seek power from Parliament to buy him out, and to extend the site, and to open some new streets of access to it. The site should be carried eastwardly its full width to Wellington-street and Bow-street, which ought to have in front of the east end of the market a width of 80 ft. or 100 ft. Westwardly, it should extend not beyond Southampton-street, and the whole of this space would, with a central covered street, give ample space for vegetables. The fruit and flower market would form a separate affair, divided opposite the end of Southampton-street by a wide street, and extending west along King-street and Henrietta-street to Church-passage, being in two houses, having St. Paul's Church and fore-court lying between. The above would far more than double the existing accommodation; and considering the vast trade present and prospective, ought not to entail any pecuniary sacrifice upon the ratepayers. I suppose an entirely new construction would be necessary; and, if so, provision ought to be made in a lofty basement for future subterranean railway connexion with the great line north and south of the river. The basement could also be utilised as a freight station, having a tunnelled entrance to the Strand for ordinary van and wagon traffic. This would be a similar arrangement to the Great Western at Smithfield, but with the advantage of a level carriage-way to the Strand in place of the circular incline leading to that station.

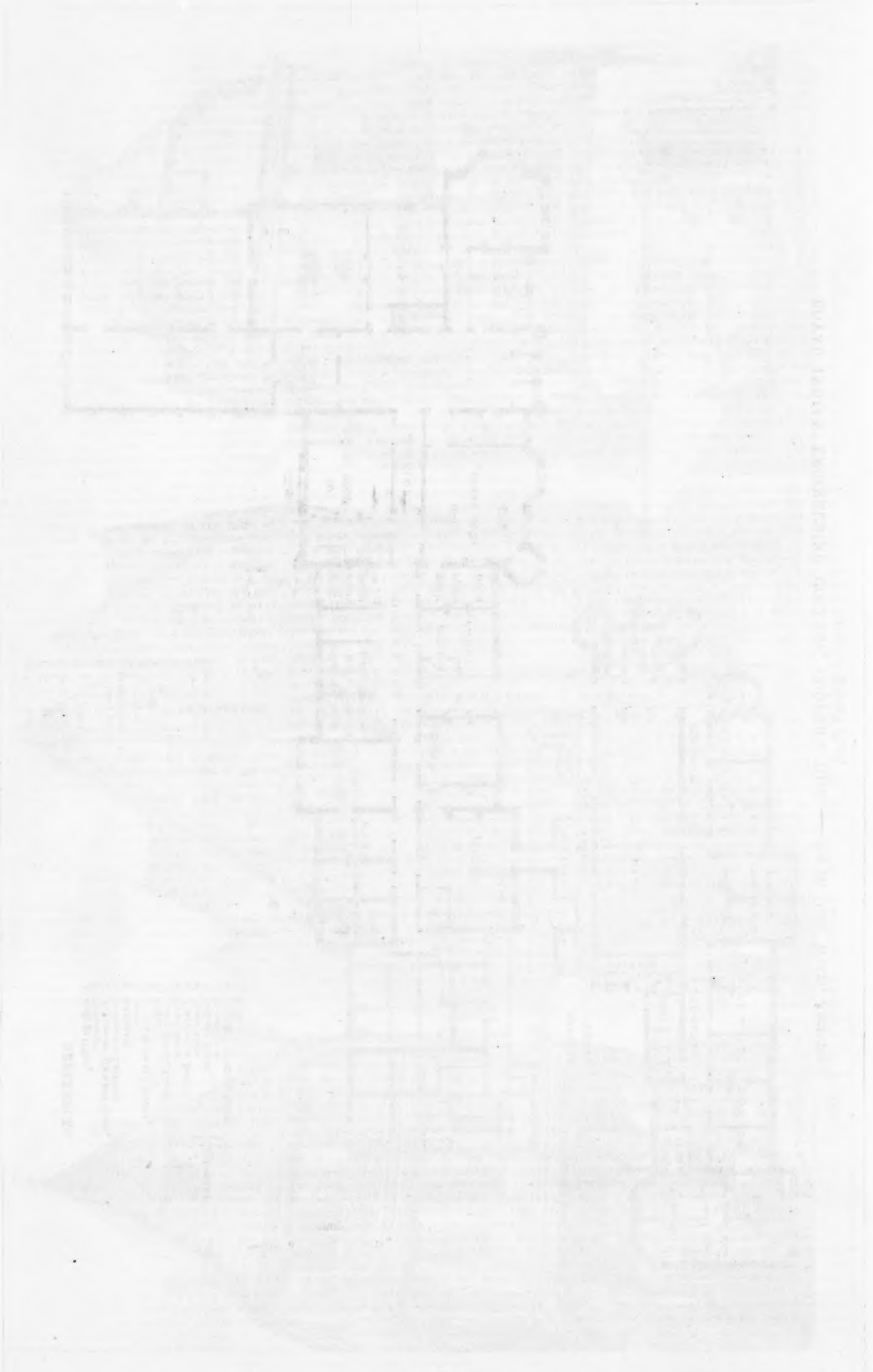
In conclusion, I would respectfully urge upon all classes to join in an active agitation to get rid of the miserable muddle we submit to in the matter of local government. The vestries should be replaced by regular municipalities of from 150,000 to 250,000. This would reduce the number from forty to fifteen, or not exceeding twenty. The City limit should be extended, so as to double its present population, and the present Board of Works, which is only a vestry, should be replaced by a body formed by direct election, like the School Board. If we start on a basis of one member to 50,000, this would give sixty-five, to which might be added one delegate, appointed by each local body,—say, fifteen,—in all, say, eighty. If men were really in earnest, such a reform is quite within their power, in spite of vested interests; and nothing satisfactory can be done without some such change. J. W.

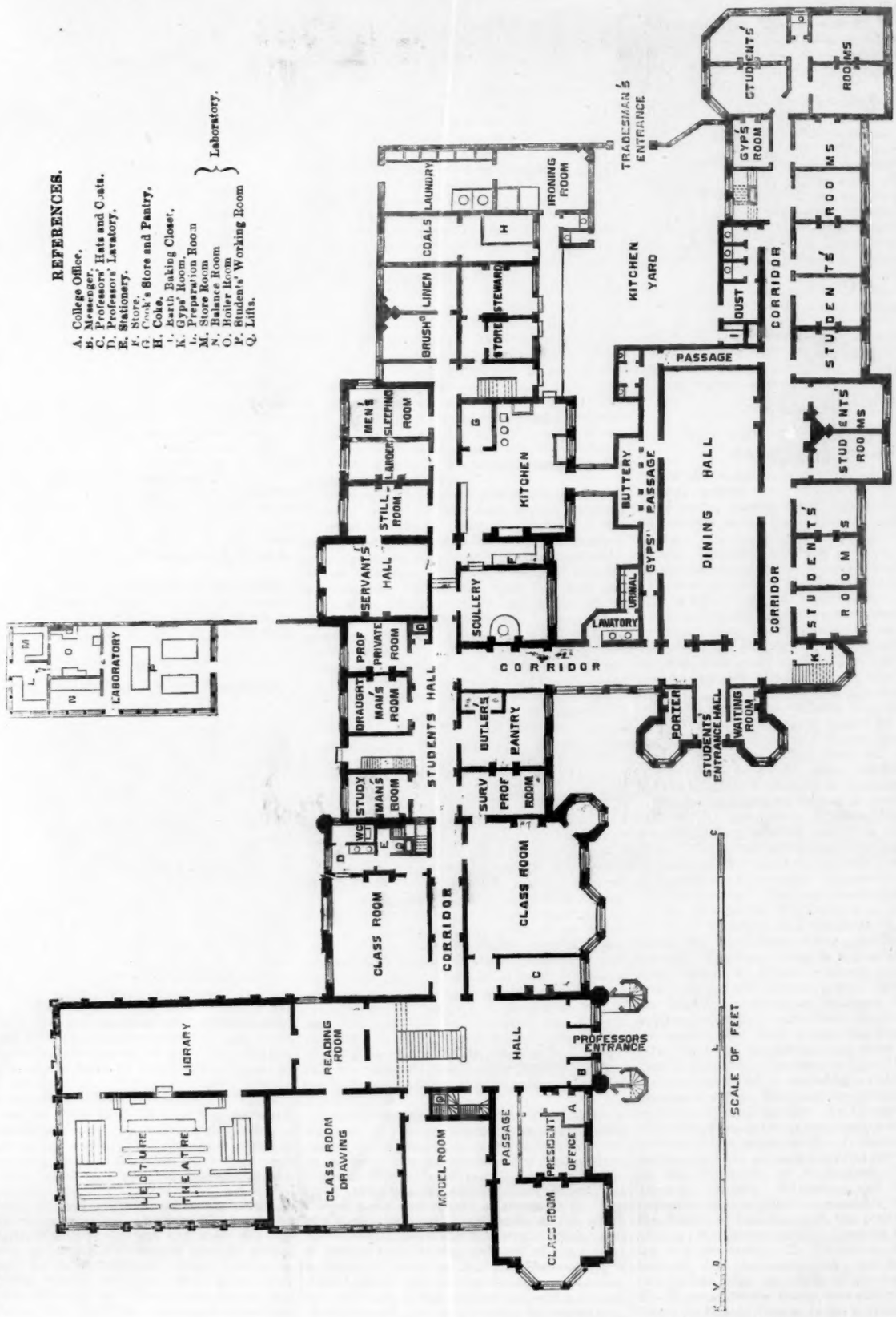
THE NEW COUNTY COURT, GAINSBOROUGH.

THE old mansion, at the corner of Beast-market, erected in 1759, from designs by Hawksmore, having been purchased by the Government, it has been extended and altered, to meet the requirements of the court and offices. The alterations and additions are now nearly completed, and it is proposed to hold the first Court in the new building on the 14th inst., when it will be opened to the public. The unsightly projecting steps have been removed from the front door in Market-street, and a new Ancaster stone doorway of Grecian architecture inserted, with small shafts above the transom, and having two circular panels, with a carved monogram, the date 1870 at the sides of the door, and the words "County Courts" incised in the transom. Access is gained by this door to the public offices, and to the bailiff's and bankruptcy rooms. This door will form the public entrance for all office business. The judge's entrance is situated in Beaumont-street.

The old dining-room, having at various times fulfilled the uses of a kitchen, larder, and scullery, is now restored nearly to its original form. There is a new strong room attached to this office. The public entrance to the Court is at the south-east corner of the new buildings in Beaumont-street. The front is executed in red bricks, obtained at Walkeringham, and is relieved by a cornice and dressings of Ancaster stone, the mouldings being Grecian, freely treated. The Courthouse is a handsome, lofty room, lighted by fifteen windows, semicircular heads, glazed with ground glass. The walls of the Court are panelled as wainscot, 6 ft. high, in clean yellow deal, varnished; the fittings also are clean yellow deal, except the doors, seats, table tops, and mouldings, and these are oak, French polished. The Court is lighted by bronze gas standards, and is heated by a Peirce's pyro-pneumatic stove. The chimney-pieces and lavatories are of fossil marble. Mr. George Johnson of Nottingham, is the general contractor. The foreman of the works is Mr. J. Johnson. The gas-fittings have all been supplied and executed by Mr. Freeman, of Vine-street, Piccadilly, London. Messrs. Whetstone, of Coalville, Leicester, have supplied the encaustic tile floors; Mr. Mason, of Gainsborough, the plumbing and glazing; Mr. Calvert, of Gainsborough, the painting and decorating; Mr. Tomlinson, of Gainsborough, the plasterer's work; and Mr. Robert Phillips has been the clerk of the works; and Mr. Thomas Charles Sorby, late surveyor to the Crown for County Courts, is the architect.

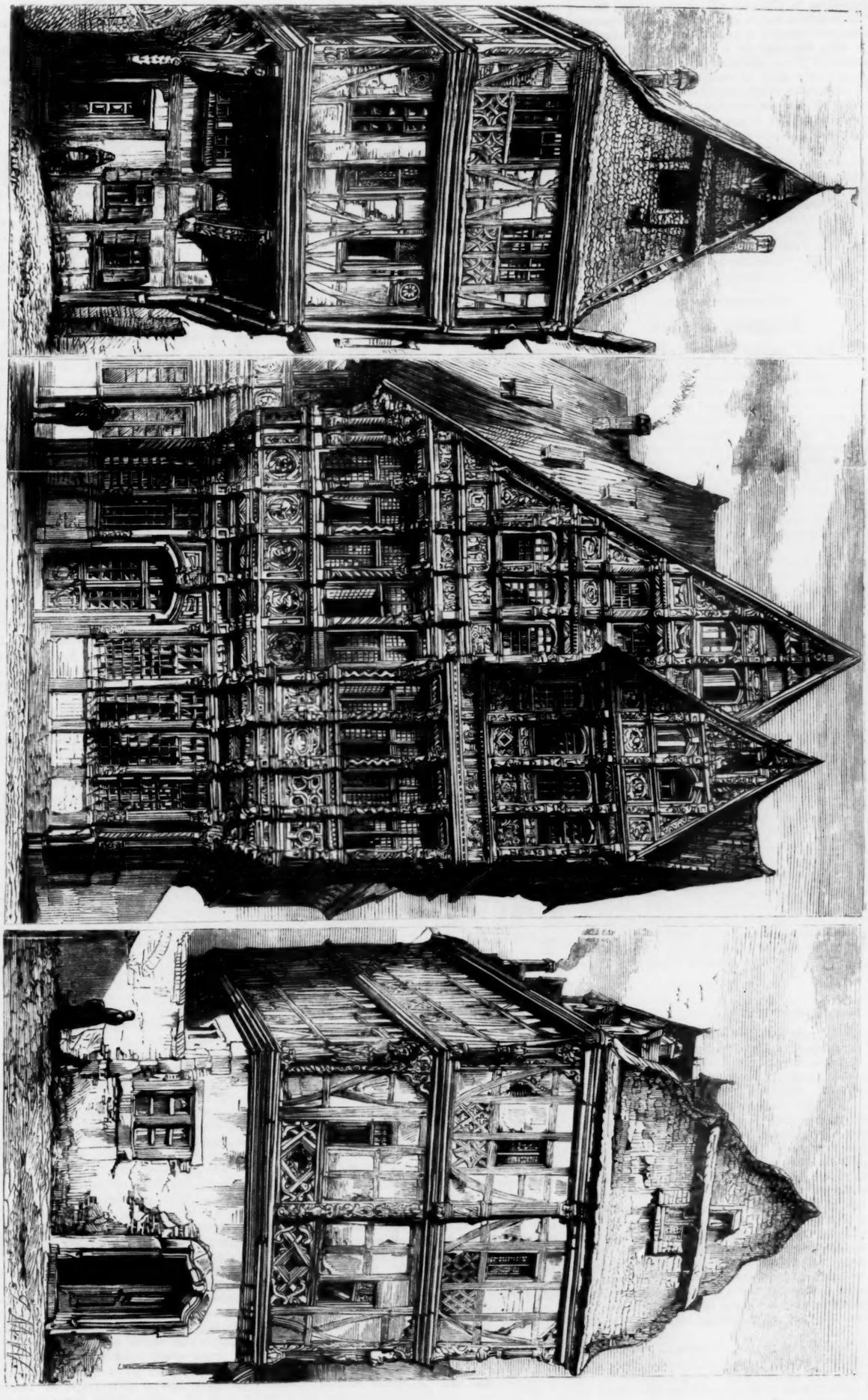
Heath - Common Stone Quarries. — These extensive stone quarries, situated near Wakefield, in Yorkshire, with a face of rock nearly a quarter of a mile in length, have now passed into the hands of Mr. Stephen Seals, of the Darfield Stone Quarries, Barnsley.



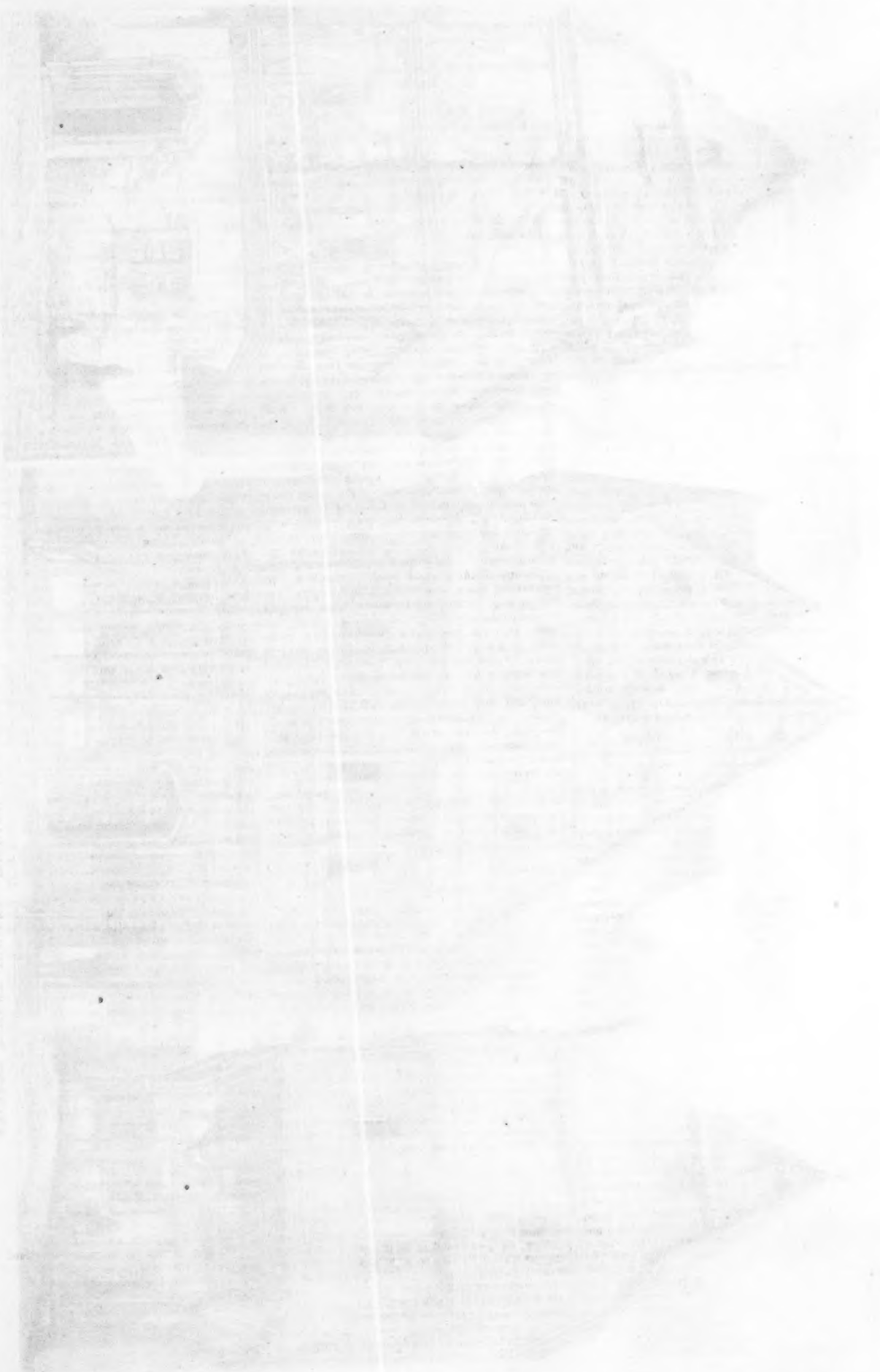


ROYAL INDIAN ENGINEERING COLLEGE, COOPER'S HILL.—Sir M. Digby Wyatt, Architect.

Plan of Ground Floor.



ANCIENT TIMBER HOUSES: BOPPARD AND HILDESHEIM, GERMANY.—*Sixteenth and Seventeenth Centuries.*



ANCIENT TIMBER HOUSES, GERMANY.

Some of our readers may be led to wonder why we have again returned to the subject of timber buildings, when so few works of this description are now carried out in this country. We feel sure, however, that a careful study of the examples of this kind of construction which we have lately given, would be most valuable and useful to those architects who have to make designs for the colonies. The timber buildings recently erected in New Zealand, for instance, show such a misapplication of material, and the magnificent timber to be easily obtained, both in that colony and parts of Australia, offers such wonderful opportunities for the formation of a really artistic and scientific style of architecture, that we think we need offer no apology for returning to this interesting study.

We give in our present number three examples of timber houses of the most elaborate description; in fact, it would, perhaps, be difficult to find three more interesting specimens of this class of buildings.

The example on the left is at Boppard, and dates from the end of the fifteenth, or the commencement of the sixteenth century. This is what is called a "timber-framed" house; that is to say, the timber is used only for constructive purposes, all the other portions being of brick and rubble, covered with plaster. It will be seen by referring to our illustration, that the timber work commences at once from the foundation, or at least from a basement of masonry, not more than 2 ft. or 3 ft. high. The timbers are not moulded or carved, except those forming the corbels supporting the upper story, and the "bressummer:" the effect of richness is gained by the struts and braces all being exposed to view. Four little pierced panels introduced into the flat surfaces, near the angles of the upper story of this house, are singular and pretty, and would offer a good suggestion for ventilation, though we were unable to find whether they were intended for this purpose, or were simply meant for ornament. All the timber work in this house has been painted a dull red colour, which has a good effect, and is probably original. The gable is covered with small scale-shaped slates.

We give a second example from Boppard. This is of a later date than the former, more elaborate in design, and more complicated in construction. It dates from the commencement of the seventeenth century, and is what is called a "half-timber house;" in other words, only the upper portions of the building are of timber, the basement story being entirely constructed of solid masonry. Here it will be observed that the constructive portions of the timber work are richly carved, and ornamental panels of wood are introduced, though sparingly, into the flat portions of the walls between the constructive timbers. These panels for the most part consist of a kind of rude parquetrie-work, with occasionally a lozenge or circle sunk in the centre. The gables do not follow the outline of the roof, but take an ogee form. They are framed in wood, covered with slate. This form of gable for timber work is not commendable, as it is unsuited to the material, and excessively costly, nor is the effect at all satisfactory.

Our third example is from Hildesheim, and is a most sumptuous and superb specimen of late timber construction. This house is entirely of wood. All the constructive portions are richly carved, and the wall spaces are formed by a series of very rich panels filled with human figures, grotesques, animals, and elaborate arabesques. It will also be noticed that there is much more window space in this example than either of the former ones. The gable here is singularly striking, and the great bay-window which is also gabled, forms a wonderfully picturesque feature. This splendid building is a work of the seventeenth century, and is a good type of the domestic architecture of Hildesheim, of which place, did our space permit, we might give a hundred illustrations, so rich is that interesting town in examples of ancient timber construction. We will, however, only mention one other building, and that is a large oblong edifice which must, from its appearance, have originally been a church. It stands east and west, and consists of one single nave of moderate size. The constructive parts alone are of timber, the walling being composed of lath and plaster. It is probably a work of the sixteenth century, and rather plain. There is a small square bell-cot on the western gable. This building is now used as a store, and the interior has been so mutilated and destroyed, that it throws little light upon its original arrangement. This is one of the very few timber churches we remember to have seen, and reminded us of the singular church of Warburton, in Cheshire, which is one of the best-known timber churches in this country. The similarity between the two buildings must have been still greater before the late chancel and tower were added to Warburton Church. Before leaving this subject, we may say that, if we mistake not, there are other timber and half-timber churches existing in Cheshire, and we should be glad to know something more about them.

CONFERENCE OF GERMAN ARCHITECTS.

Sir,—At one of the last meetings of the Institute, I mentioned, for the information of members intending to travel in the south of Germany this autumn, that the Sixteenth Biennial Conference of German Architects would be held in September next in Carlsruhe. Permit me to inform them that it has now been postponed until the autumn of next year, partly because many architects are still doing duty with the armies of occupation in France, and their practice is being attended to by professional brethren at home, thus imposing upon the latter much extra work; partly because the gradual return to the peaceful arts by those who took an active part in the war has not given them sufficient time for the preparation of papers, questions, &c. Alfred Strong.

Berlin.

THE CENTRAL HALL OF THE PROPOSED LAW COURTS.

I was much interested in reading, in your issue of July 1st, James Fergusson's remarks upon the "Central Vaulted Hall" in the New Law Courts.

I most sincerely hope you will not add to the many magnificent blunders that have been made in this country (America)—and, perhaps, some with you—of building great interior halls cut off from direct communication with the external air, and, perhaps, worse—from the purifying rays of the sun.

We are fairly groaning, or had I better say perfectly paralysed, with all the vitality,—yes, and the very humanity,—bleached out of thousands of our citizens, by this fatal error of building interior rooms for offices and board-rooms, and for large assembly-chambers. Not in this city alone, where there was some excuse for such neglect of these great sanitary principles, but the *fashionable* plague has spread throughout the whole country.

The main halls of our national capitol being thus located, call out annually the indignant protests of so many of our air-loving and sunshine-loving legislators;—so, too, our colleges, our schools, our hotels, and many of our public buildings throughout the whole land; and worst of all is our horrible tenant-house system of this city. Many of these are grand new structures, six or eight stories high, with elegant fronts of brown stone, but in which three-fourths of the inmates sleep in interior rooms or closets into which the direct rays of the sun never enter. It has been very astonishing to me to see how very rapidly this fatal mistake spreads into the country after the building of an elegant hotel in the upper part of our city, in which the front room was used as a parlour, and the back one divided into two apartments for bed-closets.

This made such a convenient arrangement for families, that it spread like a devouring pestilence.

But fortunately such buildings are being abandoned, or altered almost as rapidly as they were constructed.

I was requested lately to visit a new building occupied by the students of one of our most flourishing young colleges, and found it beautifully perched among the hills overlooking a most charming country. But can you imagine my surprise at finding the horrors of a New York tenant-house multiplied fourfold? They had built a solid block, about 100 ft. by 175 ft., with a complete set of interior rooms, only lighted by an interior well, closed tight at the top by a skylight.

Their central space was used below for a kitchen, lighted mostly by gas, and the story above for a grand dining-hall.

The students using these central rooms sickened so rapidly that they wondered what could be the matter.

My indignation at the stupidity of professors occupying such prominent public positions, and disregarding in so glaring a manner the great sanitary requirements of sunlight and pure air was (must I say, unfortunately) so illy concealed as to almost give offence to those who were so proud of their newly-completed monument to the good cause of public education in its higher branches! No—let me beg of you, on behalf of the cause of true sanitary science, not to express in so costly, elegant, and enduring a manner—and that, too, at the great centre of civilisation,—such disregard of the Creator's greatest temporal blessings to man—sunshine and pure air. I can reiterate most feelingly Jas. Fergusson's plea for the lawyers,—"They do not want to be stifled in dark, close consultation-rooms, nor to breathe the pestilential air of a deep, dark well-hole when taking a slight refreshment."

L. V. Leeds, *Engineer of Ventilation.*

New York.

MALTING CISTERNS.

Your correspondent, "Maltster," inquires the best manner of lining the bottom of a cistern, so as to prevent the cast-iron plates cutting or wearing the lead. This can be done by lining the bottom of the cistern and gutter in the usual way, and afterwards closely soldering stout zinc or copper angle-pieces, so as to form a lining to the inside of the rebate carrying the cistern plates. I have always found lead a costly and unsatisfactory material for this purpose, and I should hesitate in using it for so large a cistern as that named by your correspondent. I believe brick and cement to be the best; and where this cannot be used, in consequence of the cistern being above the ground-floor, then a cast-iron cistern, properly made, answers very well. I have lately constructed one capable of steeping seventy-five quarters in cast iron, and it works in a very satisfactory manner.

B. A.

THE ROMAN PAVEMENT AT BIGNOR.

Perhaps a notice in the *Builder* of the present state of the fine Roman tesselated pavement at Bignor, Sussex, may cause some steps to be taken for its better preservation.

On the occasion of a recent visit to the spot, I found the remaining portions of the pavement of the magnificent villa which, together with the inner court, once covered 6 acres of ground, were well protected from the weather by substantial sheds raised over them; and it is due to the owner of the property to say that he appeared anxious for the preservation of these antiquities, and conscious of the importance of his possession; but I observed that the mice were making grievous havoc of the beautiful pavement in several places, by burrowing holes and otherwise disturbing it. I was informed that it was difficult to stop their depredations, and I fear that little or nothing is done to prevent the work of destruction. Surely such treasures need not be given up to the mice. L. H. B.

ROYAL ARCHÆOLOGICAL INSTITUTE.

The members of this institute now in congress at Cardiff, are making many pleasant and instructive excursions, but the papers read have been few in number. A *soirée* given at the museum was not very well attended. On this occasion a drawing of a handsome rood-screen in Llangwm Church, was exhibited. About the history of this screen Mr. Seddon gave some curious information. After the discovery of this work, which he described as being very artistic, he said an attempt had been made by the Duke of Beaufort to purchase it of the churchwardens of the parish, who, however, refused to sell it. Orders were then given by some one to a builder to steal it, and part of it was actually stolen; and he (Mr. Seddon) had heard that at Tortworth (Gloucestershire) the stolen parts had been used to make a screen. At Patricio, a remote church among the mountains near Llanlowy Abbey, there are some specimens of carving even more perfect than that in the Llangwm screen.

The visit to Caerleon was found very interesting by many. Caerleon is a small town on the Usk, and was once the metropolis of Wales. Mr. J. E. Lea conducted them to as many of the show-places as there was time to inspect. A museum

has been built in the village, where the relics of the past which have been exhumed from time to time in the locality are stored and taken care of. It includes two tesselated pavements. One of these, which is complete, was from a villa at Caerwent (examined last week), and is perfect. The mound in the outskirts of the village was visited. It is about 300 yards round at the base and 90 yards at the summit, and is ascended by a winding path. Mr. Lea said there could be no doubt that it was artificial. It had been said to be Roman by some and British by others. Probably both were right. The field below was the site of a Roman villa, a part of the walls of which ran into the mound. The visitors afterwards inspected a ridge of amphitheatral form, called Prince Arthur's Round Table, in proceeding to which the party walked alongside a considerable remnant of the old Roman wall. The facing of the wall has been removed, no doubt for modern building purposes. The "Round Table" is of oval form, 222 ft. by 192 ft., covered with turf. Nothing is known of it, nor why it is so called.

CURIOSITIES OF CONSTRUCTION.

Sir,—We have our "curiosities of literature," why not those of "building construction?" As a contribution towards such a collection I send the following. A gentleman's mansion is now approaching completion in the North of England, from the designs of a London firm of architects, and under the personal superintendence of a clerk of works appointed by them. This man was formerly a bricklayer. In the roof of the mansion is placed a cistern of a capacity of some 200 to 300 gallons, with the provision of a standing waste-pipe, *nine inches* in diameter, made by the direction of the aforesaid clerk of works out of stout sheet lead, and carried down through the mansion to the ground, and there contracted and connected with a 6-in. glazed drain-pipe. I think, sir, it is very probable this is the largest standing waste in any dwelling-house in this country, and the dwellers therein will not be envied, as the pipe is not trapped, and therefore a ready means of conveying sewer gases into the house.

We have heard something recently of the inability of joiner clerks of works. This is an instance of inability of a clerk drawn from another class in the business. E. G.

THE TEMPLE OF DIANA.

Sir,—The Temple of Diana is right, but there is something doubtful about the mode of discovery. The site so mysteriously discovered is that pointed out by the eminent writer on art, Dr. Guhl, and drawn on the plan by the traveller and geographer, Henry Kiepert. The site of the portico of Damianus was founded by another eminent archæologist, Baron Probesch Otten, the well-known Austrian ambassador at Constantinople. The tomb of Androclus, the Magnesian Gate, the bifurcation of the Magnesian road and the way to the temple are laid down all right on Guhl's map, so that it was not necessary to discover them afterwards.

I consider it of great importance that our explorations of the temple should not be dimmed by claims which may bring down on us the remonstrances of the learned world of Germany, and that the expedition should be on an adequate scale, and have attached to it a competent archæologist. There will be glory enough for us if the exploration be but properly carried out; otherwise we shall be landed in a muddle, and indeed the affair has been but little better than that for ten years. Ephesus.

SHAKSPEARE'S MONUMENT.

Sir,—There has been much said and written of late with reference to the immortal bard, Shakspeare; but is it not strange to say and strange to think that, in this country, wherein we have so much reason to boast and to feel grateful for the happiness, pleasure, instruction, and thought that we are beholden to him for, we have neither street, square, nor even an appropriate theatre to display the talent of his mind in, and not even a public monument erected in any of our squares, parks, &c.,—a disgrace to the country, when one sees how our countryman's marvellous talent and mind are appreciated in foreign lands, who would ages since have executed such a monument as would have been the wonder of the age and world? But here, when you propose any grand thing, the Government cry out that they have no funds for such an undertaking; whereas, if such a proposition were made in the right spirit, not only this country, but every foreign State would be ready and willing to send forth its aid, to our shame. How much longer is this parsimonious feeling to exist? Why not some influential parties stand forth, either in the form of our nobility, or men of talent, of every description, either literary, scientific, and so on? A sum of money would soon be raised to fulfil such a pact, and then to call forth the talent of artists, either as painters, sculptors, or architects. There is talent sufficient in the country to accomplish all this; and let encouragement be afforded at length to the arts, and prove what can or could be accomplished in the same form as was done in the case of the Houses of Parliament, or even such a work as the Albert Testimonial in Hyde Park. It is not yet too late to accomplish this; and let our Sovereign and the whole of the Royal family of England affix their names to so noble a deed, to hand down their names to posterity. Awake, thou that sleepest, and be doing!

An Old Subscriber.

STRANGER AND STRANGER STILL.

The following tenders have been delivered for alterations and new seats in the parish church of Gravesend. Messrs. Wadmore & Baker are the architects:—

Lascelles	£495	0	0
Marsland	477	0	0
Hutchins	418	0	0
Bradley	406	0	0
Blake	399	0	0
Gough & Lawton	390	0	0
Saunders	385	10	0
Bragger	379	0	0
Cappe & Ritso	295	0	0
Gould	257	0	0
Rooney	180	0	0

Mr. Gould's tender was accepted.

THE INTERNATIONAL EXHIBITION AND THE WORKING CLASSES.

Sir,—At a recent lecture in St. Pancras, "On the Advantages of Annual International Exhibitions," several suggestions were made, for the purpose of getting the workmen to attend. Some proposed that it should be opened free on Saturdays, which would be a cheap way of seeing the valuable things, foreign and English, there displayed. I made some inquiries of my mates, and out of twenty only one had been to Kensington. They thought, if it was opened on Saturday at a reduced price, many would go; and that an appeal should be made to the Commissioners. I agreed to try to get a public mention of it; and as everybody who takes an interest in art and science reads the *Builder*, and as it is a great national disgrace that so few of her artizans have visited the international collection of arts and manufactures, I hope, sir, you will find a place for this in your columns.

Jack Plane.

Sir,—Will you allow me to expostulate with the authorities of the Exhibition? It seems to me they are simply ignoring the working classes altogether. Except as a holiday, how can they go with any comfort with the six o'clock closing arrangement? Nine-tenths of the workmen of London live a considerable distance from the Exhibition, and if they try to take half a day to see it, by the time they have gone home, cleaned, and reached there, they will have very little time left to inspect it. Had the closing hour been eight, many more thousands would have found their way there. Half days and even quarters would have been taken for the purpose. Is it too late to have the early closing modified,—say seven o'clock? And then in the matter of refreshments, working people want something cheaper than the second-class bar. Let the directors take pattern by the Crystal Palace.

Only a Tailor.

CASES UNDER BUILDING ACT.

RUINOUS BUILDINGS.

At Greenwich Police-court, the Blakely Ordnance Company, having manufacturing premises on the banks of the river in Greenwich-marshes, appeared to a summons, at the instance of the Metropolitan Board of Works, to show cause why an order should not be made, under the Metropolitan Buildings Act, to put such premises in a safe state, the same being considered dangerous.

Mr. Tabarer, the district surveyor, gave evidence to the effect that the walls and arches of the factory were in a dangerous state, and a gentleman who represented the company contended that the provisions of the Act relating to dangerous structures could not apply, inasmuch as the factory was not situate near a public thoroughfare, along which the general public had a right of passing, and that at the present time the only person on the premises was a man employed as a watchman.

Mr. Napier, who represented the Metropolitan Board of Works, said that it was not the intention of the Act only to protect the general public, but, by the 80th section, power was given for the district surveyor to interfere where structures were dangerous to inmates.

After some considerable argument, Mr. Maude said that hitherto he had been under the impression that complaints under the Act as to dangerous buildings applied only to cases where there was danger to the general public, but the words pointed out in the section of the Act cited by Mr. Napier were very cogent. It had been argued that the watchman employed could not be considered an inmate, and that if any other person were found on the premises he would be considered a trespasser, and if injured by the falling of the building he would not be able to recover compensation. He believed it to be the intention of the Legislature that no such dangerous structures should be allowed to remain, as there was a hazard of their falling, and even the watchman or a postman having to deliver a letter on the premises might be injured. His order would therefore be that the defects complained of in the building be remedied within twenty-eight days.

POSITION OF ARCHITECTS.

Sir,—Is there any way of ascertaining what state the architectural profession is in at present? I am acquainted with many who (like myself) are literally doing nothing, and have not been for a year or two, and clever men too.

I hardly ever go into a town, large or small, without inquiring whether there are any architects located there, and the stereotyped reply is, "Lots of them, sir;" and perhaps some well-to-do builder will tell you that they are half starved, "poor devils;" and in many cases I firmly believe it. As for going into a competition, why, it is the next thing to absurdity unless you have "interest."

Even supposing you *have* worked up a design in a very attractive style, and you get the job, you feel quite certain you cannot carry it out for the money named, and we know what follows.

Can anything be done to prevent the swarm of "quacks" from doing plans, and doing architects and surveyors out of their mode of existence? I reside near several little manufacturing towns, and one or two of us could do very well, but for the *frequent importation* of local board surveyors, who are badly paid, and frequently start in the locality on their own account, and generally disgusted with the board. These, and the quacks who do plans, make a *living* very precarious. Now, in my opinion, the people in office in connexion with the schools for which grants of money are made, almost ignore the name of an architect (it is occasionally mentioned with "builder"), for in their Form No. 7, "Expenditure," you have,—

Paid for Site, &c. ..... £
Buildings, &c. .....
Legal Expenses .....
Sundries .....

But no *Architect's Charges*. And yet he is to prepare all these plans, specifications, quantities, &c. Probably he is absorbed in the "Sundries."

I feel sorry when I see advertisements for "articled pupils" in architects' offices, and often wonder what they all merge into. I know three that are making their 700*l.* per annum in a quiet "pub" or two, and they were good architects. M. M.

LEAD PAVING AT SOMERSET HOUSE.

In the *Gentleman's Magazine* for 1798, vol. lxviii., part i., p. 9, is given a plate, exhibiting on one side a view of the back façade of the new part, next the Strand, as built by Sir Wm. Chambers, and on the other side a view of what remained of the old building. The description says that "at the time the drawing was made (probably about 1780) it showed all that remained of that once magnificent palace. The sheetings of lead on which the present pavement is laid, the watch-box, the wooden way to the remains of the old building, with part of the front, arched entrance, scaffolding, and progress of the new, are here exactly delineated, and form a view not less curious than interesting."

This "present pavement" appears to be the roadway between the balustrading of the sunk areas, and that of the area to the vaults under the quadrangle, not at that time formed. Not having before heard of this method of forming a foundation for paving, I submit the extract to your readers for a solution for the employment of the lead, with the queries,—Was it in general practice at that time, or done in this instance to render the vaults dry? Is it known to exist, or has it decayed? W. P.

HEALTH OF SOMERSETSHIRE.

When recently in the *Builder* we gave some faithful pictures of the sanitary condition of Somerset towns, two or three of the local prints not only flatly contradicted the statements, but supplemented their denials with gratuitous rudeness. The sanitary condition of every one of the towns we reported upon was bad, and the public spirit of the local authorities concerned was *nil*, or nearly so. Since, however, in almost every one of these towns action has either been forced by central authority, or has been taken in anticipation of that certain pressure: the result is that improvements are begun, and a mitigation of the evils complained of has already occurred.

In our strictures on Taunton some rather testy personage rushed in hot haste into print to prove that we were entirely wrong. But even up to the present time the Taunton Local Board of Health are beset with complaints, and more than one threatening letter from proprietors, complaining of nuisances, and calling upon them for remedy. We are glad to see that the Board are giving their attention to the complaints, and are showing a desire at last to aid in removing the causes.

The *Somerset County Gazette* makes some sensible remarks in its last issue on the question of the public health, and pendant to it puts the following pertinent question to the good people of Taunton:—

"What is the sanitary condition of our own town? Is it so perfectly satisfactory that we could meet a visitation of cholera with a full assurance that we have done all within human power for the security of life? This is a question which the local authorities of every town should ask themselves. It matters not how small the town may be, even if it is little more than a mere village. It is well known that preventible epidemics are more encouraged in small towns than in large cities. The drainage, the water supply, and the various sanitary precautions in London are undoubtedly superior to what we find in a Somerset village. Important revelations have recently been made with regard to two or three very small towns in Devonshire where disease was propagated by want of domestic accommodation and want of drainage. Where there is bad drainage there must be bad water; and medical men are continually informing the public that nothing is more conducive to disease than an impure water supply. Water is now acknowledged to be the principal medium through which diseases, such as cholera and typhus fever are conveyed from house to house, and from place to place. The sanitary organisation of a small town is, of course, not so elaborate as that of a large city. The system of drainage is less perfect, and the water supply is very different. In some of our most picturesque villages we see the greatest neglect of sanitary laws. So long as they enjoy pure air, the people absurdly suppose they can do without pure water. A cesspool or a dung-heap may be often found in close proximity to a pump; a privy which is ill-constructed is, perhaps, only a few yards from the well. When disease is favoured with all these advantages, no wonder that its ravages are terrible and fatal when it once breaks out. It is full time in these matters to have reform in all our towns. We are not living in a barbarous age, nor in a barbarous country. We make a great display of our civilisation; yet we tolerate much of that barbarous neglect of sanitary laws which is more appropriate to the villages of North American Indians than to the towns of Englishmen."

We have said the same thing a thousand times over, and fear that we shall have still to repeat it in many quarters, in the teeth of possible insult and case-hardened ignorance.

BATH ABBEY CHURCH NAVE.

The nave of the Abbey Church, Bath, has been restored, and reopened for divine service. The first appeal made to the public was for means to enable the committee to execute that which was essential to the stability and security of the building. The tender of Mr. Bladwell, amounting to 5,389*l.*, was accepted. The work was divided into three portions,—1. The roofs and clearstory, with the east, west, and large transept windows; 2. The groining of the ceiling of the nave and aisles; 3. The lower part of the building, including the cleansing of the walls, the relaying of the floor, the removal of the present galleries and fittings, and the re-arrangement of the whole area for the use of the congregation, with the warming, ventilation, and lighting. During the first year the perilous roof of the nave was strengthened in its timbers, releaded, and ventilated; the decayed lead on the tower roof was replaced by new; new battlements were erected of the design which is considered to have been originally intended; the stonework of the clearstory, west and transept windows was renewed, and the windows improved in appearance by the new form in which they were glazed. In the middle of 1865 the committee turned their attention to the stone groining of the nave and aisles, as recommended by the architect, Mr. Scott, and determined to undertake the work. In the second year (1866) the committee were unable to make that progress they could have desired; nevertheless two-fifths of the groining were finished, and through the liberality of the rector similar work in the transepts was placed in hand. The following year was a period of steady and satisfactory progress.

During 1867, the stone groining in both transepts was completed, the ceiling in the nave and aisles was advanced another fifth, making three-fifths, and within 100*l.* required for this work had been contributed. A portion of the first contract was also proceeded with during this year, the roof of the north aisle of the choir having been thoroughly repaired, and that of the south aisle being in progress. The next year saw the groining of the nave nearly completed, but 1,100*l.* were still required to make up the cost. Other parts were taken up and finished, the ceilings in the transepts were perfected, a new organ was built by the rector in the place originally proposed by Mr. Scott, and a faculty was obtained for necessary alterations in the internal arrangements. The next year a great change was wrought in the interior of the edifice, The groining of the ceilings of the nave and aisles was completed and opened to view. The floor of the nave was levelled and concreted, the monumental slabs being carefully relaid; the stone screen erected between the nave and choir at the previous restoration was removed to the west end of the nave, where it forms an inner porch; the mural tablets were removed with the view of re-arranging them below the string-course and providing space for those which were formerly affixed to the screen; and the pillars and walls were cleansed and repaired, the former being found in a very bad condition, chiefly in consequence of damage inflicted in former years when they were covered with tablets. Contracts were taken for lighting from Messrs. Skidmore, of Coventry, and for heating from Messrs. Haden, of Trowbridge, and the preparatory work necessary for carrying out these contracts was commenced. Last year the committee adopted the designs for seating the nave, and the completion of this contract with Mr. Brock, of Bristol, and other works, brings this review of the progress of the restoration, for which we are indebted to the local *Chronicle*, down to the re-opening.

ST. JAMES'S TOWER, TAUNTON.

After much controversy, amounting at times to strong disputation, as to whether this structure should be repaired or rebuilt, the matter is at length in a fair way of settlement, inasmuch as the old tower has been demolished, and the memorial stone of a new tower has been laid by Lady Anna Gore-Langton, wife of Mr. W. Gore-Langton, M.P. for West Somerset.

The new structure has to be an exact copy of the old, which was a Tudor tower, dating from the latter part of the fifteenth century, in the reign of Henry VII., and probably erected before its sister tower of St. Mary's.

The height from the ground to the top of the battlements will be 105 ft., and 116 ft. to the top of the pinnacles. The size at base within the walls will be 14 ft. square, the walls themselves being 4½ ft. thick. The lowest tender for the erection, that of Mr. R. Spiller, was 3,072*l.*, which was accepted; and, with architect's commission and payment to clerk of works, &c., the total cost will amount to 3,500*l.*, towards which 1,000*l.* have been promised. The architect is Mr. Spencer, of Taunton. The ceremonial of laying the memorial stone was attended with much *éclat*, the town being made gay with flags and streamers, and an arch of evergreens. In a cavity in the stone, in a glass bottle hermetically sealed, was placed an inscription, illuminated on parchment by the Rev. W. Kinglake. A luncheon was given immediately after the service, when about fifty sat down, including the Bishop of Bath and Wells, and Mr. and Mrs. Gore-Langton.

THE TRADES MOVEMENT.

Newcastle-upon-Tyne.—A conference of employers and workmen was held with a view to settling the engineers' strike for the nine-hours movement. Mr. Charles Mark Palmer, of Jarrow, convened the conference, and urged both sides to consider the importance of coming to a satisfactory settlement. The trade of the district, he said, was prosperous, and he thought the masters were in a position to grant a concession to their workmen. A long discussion ensued as to the resolutions which were to form the basis of the conference. The delegates could not pledge themselves that the whole body of the men would decide by vote by ballot whether they would accept the result of the conference or continue out on strike; and as the masters insisted that the final decision should be by vote by ballot, no satisfactory conclusion was come to at the conference. A mass meeting of the men was afterwards held on the Moor, at which it was almost unanimously agreed to accept no compromise, and not to accede to the ballot. At another mass meeting the following resolution was agreed to:—

"After a most careful consideration of the sixth resolution of our employers in reference to our votes being taken by ballot, the Executive Committee recommends that the employers be requested to withdraw that resolution, and that the mode of taking the votes be decided by the Mayor of Newcastle, after the masters have made their offer."

At a meeting of the master engineers this resolution was submitted, and the masters, in reply, passed a resolution to the effect that, after considering the course adopted, and the statements made by the representatives of the workmen on strike, they, with regret, deem it useless at the present time to attempt further negotiations, and therefore it was out of their power to accede to the request of the League. The employers state that they had no alternative after the positive assurance of the men that they would accept nothing short of the nine-hours demand. About 4,000 of the men on strike have left the town to seek work elsewhere.

Cockermouth.—The joiners' strike is at an end. The whole of the masters in the town acceded to the request for a half holiday on Saturdays, and the workmen returned to their employment.

Paris.—Numbers of the Communist prisoners are, by order of M. Thiers, to be released from custody. This step has been taken because the orders received in Paris cannot be executed for want of workmen. Hundreds of skilled workmen are said to have been killed in the massacre of May.

Berlin.—The masons in this city have resolved to stop work at every builder's without exception. They have appointed delegates to carry on all negotiations on their behalf with the masters with a view to a settlement of the pending difficulties. At the same time a resolution has been passed declaring it to be the duty of every unmarried mason to leave Berlin as soon as circumstances may permit. In consequence of the continuance of the strike, the Government is employing soldiers, and has issued orders to the regiments in Berlin to *tell off* all men in their ranks trained to masons' work for the duty of building the new House of Parliament, which is in danger of not being completed in time. Disturbances have occurred among the masons, the strikers assaulting those who continued work, and the police have arrested forty of the rioters. The masters have held a meeting and passed a resolution to yield nothing, in order not to encourage more strikes. The masons are receiving pecuniary assistance from the journeymen carpenters. Fifteen fresh arrests have been made. The strikers had announced a magnificent *fête* in the *Social Democrat*, but this has been prohibited by the authorities. The masters are resolved not to yield, and only four have been found to submit to the journeymen's terms. The blacksmiths have also struck for higher wages, and the carpenters are preparing to strike.

MISSION HALL, KENTISH TOWN.

In Kentish-town, a newly-erected hall for the district missionary of the London City Mission was last week opened by a public meeting, presided over by Mr. J. D. Allcroft, who has generously borne the entire cost.

The building consists of a hall, entered from a porch in Dickenson-street, with a class-room and convenient offices in the rear. It being desired to avoid a strictly ecclesiastical character in the design, and yet to express religious purpose, a somewhat free treatment of Early Gothic, with domestic outline, was adopted by the architects, Messrs. Spalding & Knight. The gable and porch towards the street are of malm brick, with red moulded cornices and strings, a rose window in the gable, with other stone dressings, being of Doulting stone. The roofs are covered with plain brown-red Staffordshire tiles. Messrs. Scrivener & White were the contractors; the iron gates and railings and the gas-fittings were supplied by Messrs. Hart, Son, & Peard.

CHURCH-BUILDING NEWS.

Bristol.—The foundation-stone of the new church of St. Matthew, Moorfields, St. George's, has been laid. The site is between the school premises and the residence of the Rev. D. Cooper. The church will consist of nave, side aisles, north and south chapels, chancel, and sacrarium, with tower and spire, 120 ft. high; the south chapel forming the minister's vestry, and the north chapel the organ-chamber. The style of architecture is early thirteenth-century work, the tracery of the windows, wherever introduced, being plate, and all the detail generally being of a simple character. The walling will be of Pennant work, polled, with freestone

dressings; the inner walls being plastered to the face of the stone jambs and quoins. The timber work of the roof will be exposed; in the nave and aisles plastering will be used between the rafters; but in the chancel and sacrarium the rafters will be boarded. The seats are to be open, stained and varnished. The estimated cost of the building, when completed, is 2,300*l.*, and a contract has been entered into for the erection of the nave, south aisle, chancel, sacrarium, south chapel, and tower, up to the level of the clearstory windows, at a cost of 1,600*l.*, leaving the north aisle, north chancel, and completion of the tower and spire to some future day. The church, when completed, will seat 600, and the portion about to be built 450 persons. The contractors are Messrs. Wm. Banner & Co., of Bristol; and the masons' work will be executed by the Messrs. Beaven, of Bedminster. The architect is Mr. J. Neale, of Bristol.

Bengeworth.—The sum of 3,300*l.* has been subscribed towards the rebuilding of Bengeworth parish church.

Clerkenwell, London.—The memorial-stone of a new chancel has been laid at St. Philip's, Granville-square, Clerkenwell, in memory of the late incumbent, the Rev. Warwick Reed Wroth. The committee who have undertaken the task of raising the necessary funds for completing the work, state in their appeal that it is intended to rebuild the east wall of the church, to refit the interior of the thus improved chancel, and in other ways to complete the memorial nave. The nave proper of the church was re-seated by the exertions of Mr. Wroth, in 1860, at an outlay of several hundred pounds, and the work proposed formed part of the scheme he was unable to complete. The east wall was in a ruinous condition; there was no proper chancel, no vestry, and no place for holding classes, &c. St. Philip's, the committee further state, is the only church for the parish, which has a population numbering now probably nearly 12,000 people. The church seats only 400 persons. The alterations will provide extra accommodation for 183 adults. The total cost of the work will be about 1,000*l.* The architect is Mr. Withers, and the builders are Messrs. Dove, Brothers, of Islington.

Gainsboro'.—Trinity Church, after being closed for alterations, has been re-opened. The chief alterations are a new oak screen and pulpit, and the lengthening of the chancel 4 ft. or 5 ft. into the nave, to give more room for the choir. The screen stands on the chancel-steps, and is about 12 ft. high. The upper part of the front consists of seven arches; the six side ones are of equal width, with trefoil heads and pierced spandrels, the centre one being considerably wider than the others, and open to the floor, with low gates. The work of screen and pulpit is of the character of that of the thirteenth century. The designs were prepared by Mr. J. L. Pearson, London. The pulpit was executed by Mr. Robinson, of London, and the screen by Mr. Cant, of Gainsboro'. The church has been cleaned and renovated, the roof of the chancel being ornamented. A medallion of the Crucifixion has been promised for the east window.

Books Received.

The August number of *Hardwicke's Science Gossip* contains a particularly interesting and instructive article by Major Holland, headed "The Trawl." The trawl being let down, the writer describes what is brought up from the sea. A number of illustrations increase the value of the article.——In the current number of *London Society*, Mr. Planché carries on his very interesting "Recollections," which treat of Stephen Price's career at Drury-lane, the foundation of the Garrick Club; Hook, Malibran, the author's first Extravaganza; Luttrell, and Rogers. A pair of prints in this same number, headed, "Paint and Powder," are powerfully suggestive. ——"Atchley's Builders' Price Book for 1871" (Kent & Co.) includes a useful paper on "Iron applied to Building Purposes," by Mr. Fras. Campin, C.E.——"Practical Tables and Rules for Steam-engines. By H. Haedicke, under-engineer in the German navy. Kiel: Schwers. London: Nutt." These are no doubt useful tables and rules by a competent author, but the publication much requires revision by a mathematician acquainted with the English language.

Miscellanea.

The Health of Marylebone.—The annual report of the medical officer of health, Dr. Whitmore, has been issued in a printed form. It shows that, notwithstanding fever and small-pox, the sanitary state of Marylebone has been favourable during the past year. As remarked by Dr. Whitmore, in reference to diseases of the miasmatic order, "an increased zymotic activity in any one of them is productive, in some way or other, of diminished activity in all the rest." He is of opinion that although some few diseases of the zymotic class are propagated only through infection or contagion, typhoid fever, while also highly contagious, will have its origin traceable to bad drainage, cesspools, impure water, accumulation of animal and vegetable refuse, and other such nuisances. And as to typhus, overcrowding, impure atmosphere, and insufficient food, are its more commonly exciting causes. The water supply in Marylebone is said to be good. The reporter prefers hard to soft water for health, and maintains that the death-rates of cities and towns justify the preference. He insists upon intermittent water supply in preference to constant, on like grounds. The measures of the water companies for the prevention of waste in constant supply, he foresees, will militate against the cleansing of closets and drains, which are now cleansed where there are no cisterns, by waste that is winked at by the companies under the intermittent supply. And as for the stagnation of water in cisterns, they are seldom or never large enough for that among the crowded poorer classes.

The Ventilation of the Queen's Asylum for Children, Hobart Town, Tasmania.—The cubic space afforded in this asylum has given rise to a correspondence, in course of which we are referred to as an authority on the subject. Dr. Coverdale urges that "in all cases efficient ventilation will compensate for want of cubic space;" and against this doctrine Mr. E. Swarbreck Hall protests as too sweeping in assertion. That efficient ventilation will compensate for want of cubic space, in many cases, cannot be doubted, but not in all. And, moreover, even where the ventilation is efficient, as such, in decidedly small spaces it must be made so "efficient," that the apartments are necessarily converted into perilous draught-boxes, which may be still more injurious to life than defective ventilation. And then, too, it is very doubtful whether any system of ventilation yet known can be safely trusted to, or depended on, for efficiency, either in small spaces or in large. In short, much discretion is called for in the adjustment of space to numbers, and of ventilation to space.

The Thames Embankment.—The Select Committee of the House of Commons on the Thames Embankment have met to consider their report. The conclusion arrived at by a considerable majority, in spite of the opposition of the Chancellor of the Exchequer and the Attorney-General, supported by Mr. Laird and Mr. Anderson, is favourable to the claims of the public. On the motion of Mr. W. H. Smith, a resolution was passed, recommending that the greater part of the land in dispute, about 2 acres in amount, should be set apart as a public garden, to be held from the Office of Woods, under a lease of thirty-one years by the Metropolitan Board of Works, at a rental on the same scale as that paid by the Duke of Buccleuch and other lessees of crown property. To the crown itself is reserved for building purposes the line of land continuous with the houses in Whitehall Gardens. The committee asks the Government to take the necessary steps to give effect to this resolution.

Art Union of London.—In the ensuing distribution, the chief prize will be the fine group in marble of the Wood Nymph, now in the International Exhibition (No. 2,505), for which the premium of 600*l.* was awarded to Mr. Birch, as the result of a competition, when fifteen life-size works of various degrees of merit were submitted. For the current year, each subscriber will receive a set of eight plates, representing Sea-coast Scenes under various conditions of weather, the works of some of our best artists, engraved in the first style in the line manner by Messrs. Brandard, Cousen, Prior, and Willmore. The exhibition of works selected by the prize-holders of the past year will be held at the Gallery of the Institute of Painters in Water Colours, 53, Pall-mall, from the 9th to the 29th of August.

The Memorial of the Rev. W. B. Mackenzie.—The designs of Mr. S. Dutton Walker, F.S.A., have been selected by the committee for erecting the monuments proposed to be placed in St. James's Church and Schools, Holloway, London, to the memory of the Rev. W. B. Mackenzie, the late pastor. The design for the memorial proposed to be erected in the chancel of the church is Greek in style, the church itself being in that character. The monument will be constructed principally of French stone. The inscription tablet will be Sicilian white marble, and a white marble cross, wreathed with a crown of thorns, occupies a panel in the upper part of the monument. The whole is carved with Greek ornaments. The other memorial, to be erected in the school-room, in which Mr. Mackenzie took a peculiar interest, will be of the Decorated Gothic style, with trefoil-headed tablet and spandrels and carved hoodmoulds. The execution of the work has been entrusted by Mr. Walker to Mr. J. Birnie Philip.

Opening of New Home for Penitents, at Manchester.—The New Home for Penitents, situated in Victoria Park, near to Dickenson-road, Manchester, has been opened by the mayor. The institution has been established in connexion with the Roman Catholic body, and will be under the management of "The Sisters of the Good Shepherd." They had previously occupied a building in Levenshulme, where from sixteen to twenty female penitents were received. The building is of brick, and is in the Domestic Gothic style. It is designed to afford accommodation for 260; but the central part only, with chapel, dormitories, and offices, has yet been erected, wherein accommodation is provided for about 100. The cost up to the present time has amounted to 6,000*l.* Mr. W. Nicholson, of Manchester, is the architect; and Mr. Healey, of Salford, the builder.

Prison Discipline and Reformatory Treatment. — An International Congress on this subject is to be held next year in London. The idea originated in the United States, and the task of arranging the preliminaries was imposed on Dr. Wines, secretary of the National American Prison Association of New York. He has entered into communication with persons of all nations, and with the accredited representatives of their Governments resident at Washington. He now comes to England accredited by the Government of the United States, to take steps, with the several Governments of Europe, and with those interested in the subject, for the organisation of the proposed congress. The council of the Social Science Association, at their last meeting, resolved unanimously to co-operate with Dr. Wines in every practicable way in prosecuting the objects of his mission. They have issued a circular explaining the purposes of the congress.

London Suburban Water Supply.—The West Surrey Water Company has been incorporated by Act of Parliament, with a capital of 25,000*l.*, in shares of 10*l.* each, and borrowing powers, 6,000*l.* The company's Act secures to it the exclusive right of supplying the districts of Chertsey, Walton-on-Thames, Hersham, Oatlands Park, Weybridge, Cobham, Byfleet, and Shepperton, with water. These places, at present, are almost entirely dependent upon wells for their supply. In consequence of defective sewerage and other causes, this well-water is admittedly bad. The new water is to be supplied from the Thames, near Walton Bridge, pumped into the mains, and conveyed into a covered reservoir to be constructed on St. George's-hill, near Oatlands Park. A provisional agreement has been entered into for the construction of the works for 23,500*l.*

The New Act on Hampstead-heath.—The local Act has just been issued to transfer to the Metropolitan Board of Works the open space known as Hampstead-heath, and to preserve, improve, and regulate the same. The Board is to pay 45,000*l.*, the purchase-money, on which Sir John Maryon Wilson and Spencer Maryon Wilson are to execute a conveyance of the property. The money is to be paid on the expiration of three months from the passing of the Act on the 29th ult. The heath is to be kept open, and the Board is not to sell or in any manner dispose of any part of the heath, nor to cut the turf nor sell the gravel, &c. The heath may be drained, with power to make roads and otherwise to effect improvements for the public benefit.

The Amalgamated Society of Carpenters.—The question whether the Amalgamated Society of Carpenters and Joiners is a trade-union or a friendly society has been under the consideration of the Marlborough-street police magistrate. The executive council had ordered one branch to pay over to another the sum of 5*l.*, and on the trustees of the former refusing to do so, a summons was issued against them. On their part it was pleaded that as the organisation was a trade-union, the magistrate had no jurisdiction. Mr. Mansfield adopted this view, and dismissed the summons, with an intimation that the complainants' remedy lay "in another direction."

The Birkbeck Permanent Building Society.—The annual report and balance-sheet of this society, just now presented to the shareholders, serves to show the remarkable extent of its operations. The gross receipts since the formation of the society have nearly reached 8 millions, while those of the past year have reached 1¾ million, which shows an increase over the years previous of nearly 200,000*l.* The present available profits for the distribution of bonus in the year 1873 amount to 52,857*l.* 18s. 8d., and the number of members and depositors at the present time exceeds 22,500.

China Clay.—A representation has been sent to the Medical Department of the Privy Council by weavers in the Todmorden district, complaining of the serious effects resulting from their being obliged to work in weaving-sheds wherein China clay is used, and praying their lordships to send a medical inspector to inquire into the sizing system generally, and especially into the use and effects of China clay, and such other ingredients as may be necessary to make China clay adhere to the warps, so that the petitioners may be delivered from the evils they now labour under.

London Statue to Lord Derby.—At a recent meeting of the Metropolitan Board of Works a plan of the Victoria Embankment in the vicinity of Westminster Bridge, containing four sites marked by the engineer upon which the proposed statue to Lord Derby might be advantageously placed, was submitted to the members of the board. Permission was given for the erection of the statue in the Board's ornamental garden, at a point marked in the plan; and the engineer of the Board was directed to confer with the sculptor, Mr. Noble, relative to the proposed site, and to report to the Board the results of the conference at the meeting of the Board this Friday.

Cottage Hospital for Southend.—A proposal has been made for the establishment of a cottage hospital at Southend. The suggestion comes from Mr. Hayward, the architect of the Public Hall, who offers to give up any commission he might be entitled to receive in fitting up one bed in the building, presumed to cost 40*l.* to 50*l.* The cost of the building is taken at 800*l.*, to accommodate patients, with nurses' rooms and other conveniences. It is intended to be quite simple and cottage-like, but to possess all the usual necessary appliances for treating sick folk.

A Thibetan and Yarkand Court in the Crystal Palace.—The directors of the Crystal Palace have availed themselves of the results of the mission of Mr. T. D. Forsyth, C.B., into Yarkand in 1870, to add a Thibet and Yarkand Court to their collection. The new court is in the Tropical Department, on the gardens side. The first thing that will arrest the eye is a painting of the Buddhist monastery of Chimray, in Ladak, Thibet, painted by Mr. Fenton, from drawings taken on the spot by Dr. Cayley.

Silvering Glass.—Last week a piece of glass, measuring 100 superficial feet, underwent the process of silvering at the works of Messrs. Pratt & Co., Peaseley Cross, St. Helen's. This is said to be the largest mirror ever turned out of any establishment in Lancashire, and, with one or two exceptions, the largest ever done in England. The silvering was accomplished by the new process, by which the mirror is completed in forty hours, instead of occupying ten days.

Sewage Irrigation at Swindon. — The Board of Health of Swindon, Wilts, having determined to carry out a complete system of drainage have purchased a farm on which to utilise the sewage in irrigation, and are about to have it laid out. The works are entrusted to Messrs. Russ, & Minns, civil engineers, Westminster.

A Fatal Railway Station.—At an inquest, held by Dr. Hardwicke, on the bodies of two men who were killed at the goods station of the Midland Railway in St. Pancras, he called the attention of the jury to the great number of accidents which happen at this station, nearly all of which terminate fatally. He found that it was absolutely necessary (according to railway theory) for the different officials to cross the lines hundreds of times during the day, hazarding their lives every time they did so. Such a system of management, or mismanagement, ought, if possible, to be stopped. It is stated that during the past twelve months no less than thirty-six accidents have happened at this station, most of which have terminated fatally, and other sufferers who are still alive are helpless cripples. Verdicts of accidental death were returned.

St. Alban's Abbey.—The statement we printed as to the consideration shown for this building by English sovereigns at different times may not have been without its effect. The restoration committee have received an intimation that "her Majesty is pleased to consent to patronise the undertaking for the restoration of St. Alban's Abbey, in consideration of the great historical and religious interest which is attached to it."

Another New Playhouse.—We are informed that Mr. J. A. Cave is about to sell the Victoria Theatre, of which he is the present lessee, to a limited company, the object of which is to make "a palace of amusement" of the old house; and that Mr. Cave intends erecting a new theatre in the Edgware-road, which will be constructed to hold about 1,000 people. Mr. Walter Emden is mentioned as the architect of the new building.

Dwelling-house Improvement Company. It is proposed to form a new undertaking under the title of the Metropolitan Dwelling-house Improvement Company (Limited), with a capital of 25,000*l.*, in 2,500 fully paid-up shares of 10*l.* each, to improve the houses of the poorer classes in the metropolis. Mr. Thomas Brassey, M.P., and Mr. W. H. Smith, M.P., are directors of the company.

Scientific Congress at Antwerp.—Here a congress of geographical, cosmographical, and commercial science is to be held. Preparations have been made, and numbers of scientific men have responded to the invitation to attend the meetings, which will last for a week, terminating on the 22nd inst.

British Artizans in Paris.—Lord Lyons wishes it expressly stated that British artizans will not find work plentiful in Paris, and that there are no funds available to assist them back, should they find it desirable to return.

St. Luke's Workhouse, City-road.—The Poor-law Board have consented to the erection of a laundry and washing-house in connexion with St. Luke's Workhouse, City-road, at a cost of 2,000*l.* The proposed building is intended to meet the requirements of 1,500 inmates.

School, Islington.—A chapel and school in connexion with the Harecourt Home Mission are about to be erected in Britannia-row, Essex-road, Islington. On Monday evening the foundation-stone of the proposed buildings was laid by Mrs. Sinclair.

The Temple Gardens.—These fine gardens are now being carefully laid out, and the authorities have amalgamated the Inner Temple Gardens with the Middle Temple, so that the length is doubled, and presents a capital promenade.

Eastern Counties Industrial Exhibition, Norwich.—On Wednesday last, the second Industrial and Fine Arts Exhibition was opened in St. Andrew's Hall, Norwich, by the Mayor. There are about 400 oil and water-colour paintings, and a large assemblage of works of industry.

Opera Concert, Albert Hall.—The concert and promenade in the Albert Hall and Horticultural Gardens, on this, Saturday, the 5th, promise to be a remarkable entertainment.

Builders' Benevolent Institution.—Mr. Joseph Taylor, of the firm of Messrs. George Smith & Co., has accepted the office of President of this Institution for the ensuing year.

Opening of Saltaire Park.—Last week the new park at Saltaire, 14 acres in extent, formed at the cost of Sir Titus Salt, bart., was opened in a quiet and unostentatious manner.

TENDERS

For hospital, Kent County Lunatic Asylum, near Maidstone. Mr. Martin Bulmer, architect. Quantities by Mr. Geo. Ruck:—

Perry & Co.	£3,200 0 0
Dover & Co.	2,999 0 0
Bridge	2,800 0 0
Anscomb	2,757 0 0
Cox, Brothers	2,750 0 0
Davis	2,635 0 0
Avard	2,600 0 0
Abnett	2,598 0 0
Stiff	2,520 0 0
Wallis & Clements	2,475 0 0
Lacy & Torkington (accepted)	2,371 0 0

For warehouse, 82, City-road, for Mr. J. W. Gabriel. Mr. Gordon Stanham, architect. Quantities supplied:—

Turner	£3,238 0 0
Bryant	2,960 0 0
Henshaw	2,883 0 0
James	2,855 0 0
Allen & Sons	2,835 0 0
Adamson & Sons	2,796 0 0
Pritchard	2,769 0 0
Scrivener & White	2,594 0 0

For additions and repairs to Bleak House, Caterham. Mr. Richard Martin, architect. Quantities supplied by Mr. Frederick Sparrow:—

Smethurst	£370 0 0
Bray	350 0 0
Ward	350 0 0
Jarrett	340 0 0

For making new roads and drains on the Eversfield Estate, St. Leonard's-on-Sea. Messrs. F. H. Fowler & Hill, surveyors. Quantities supplied:—

Sadler	£455 0 0
Bridgeland	376 0 0
Hughes	327 14 10
King (accepted)	300 0 0

For East Barnet parochial schools. Mr. A. R. Barker, architect:—

Wood	£1,750 0 0
Pocock	1,195 0 0
Walton	1,100 0 0

For the erection of four cottages in Havelock-street, Stoke-on-Trent, for Mr. C. R. Clark. Mr. E. Penn, architect:—

Bennett	£1,150 0 0
Jones	820 0 0
Hunt	795 10 0
Barlow (accepted)	738 0 0

For the erection of Temperance Hall, Newcastle-under-Lyme, for Mr. Wm. Warham. Mr. Edwin Penn, architect. Quantities supplied by Mr. H. Blackwell:—

Hall	£1,349 10 6
Gallimore	1,050 0 0
Harvey & Davis	988 0 0
Sutton & Meadon	968 0 0

For cleansing, painting, &c., to St. James's Church, Clapham. Mr. F. T. Dollman, architect:—

Dove, Brothers	£435 0 0
King & Son	412 0 0
Barber & Sons	374 0 0
High	297 0 0

For building stables, &c., Elder-walk, Islington. Mr. J. Harrison, architect:—

Ennor	£475 0 0
King & Son	458 0 0
Browne & Robinson	439 0 0
Williams & Sons	423 0 0
Little	399 0 0
Carter & Sons	395 0 0
Palmer & Son	395 0 0

For erecting a small warehouse, Milton-street, for Mr. W. Jackson. Mr. J. C. Clarke, architect:—

King & Son (accepted)	£489 0 0

For alterations and additions to premises, Goswell-road, for Messrs. Copestake, Moore, & Crampton. Messrs. Tress & Innes, architects:—

Lucas, Brothers	£1,924 0 0
Shaw	1,813 0 0
Browne & Robinson	1,765 0 0
Ramsay	1,753 0 0
Conder	1,747 0 0
King & Son	1,560 0 0

For making certain additions to the School of Art, Miller's-lane, Kennington:—

Heath	£1,010 0 0
Gregory	997 0 0
Lamb & Son	957 0 0
Higgs	900 0 0
Cullum	888 0 0
Clarke	879 0 0
Nightingale	869 0 0
Thomson	868 0 0
Bowyer	813 15 0
Sharpington & Cole	818 0 0
Taylor	787 0 0
Basham, Brothers	735 0 0
Pitcher	668 0 0
Stephenson	667 0 0
Rooney, Brothers	665 0 0
Wagner (accepted)	639 10 0

For house, at Beckenham, for Mr. R. White. Mr. W. Seckham Witherington, architect:—

	First set of tenders.				If five built.
Slade	£655	0	0	.....	—
Mark	537	0	0	.....	£2,500 0 0
Cole	526	10	0	.....	2,362 0 0

Second set of tenders from same drawings and specification.

					If five built.
Bradford & Tilney	£690	0	0	.....	£3,318 0 0
Davis	528	0	0	.....	2,320 0 0
Neate	490	0	0	.....	2,360 0 0
Hooker & Harris	440	0	0	.....	2,030 0 0
Cave	425	0	0	.....	1,955 0 0

For house on the Oldfield estate, for Mr. Rees Davies, of Barnsbury. Quantities furnished. Mr. Wm. Paice, architect:—

Scholtes	£1,185	0	0
Crockitt	1,075	0	0
Boswall	1,003	10	0
Grover	995	0	0
Sabey	995	0	0
Williams	983	0	0
Perry	975	0	0
Loft	970	0	0
Nibiett	920	0	0
Lamble	879	0	0

For the erection of an infirmary at the Industrial Schools, Leytonstone, for the Guardians of Bethnal-green. Mr. William Mundy, architect:—

Dover, Dowell, & Co.	£3,588	0	0
King & Son	3,460	0	0
Rivett	3,387	0	0
Ennor	3,300	0	0
Arber	3,100	0	0
Blackmore & Morley	2,991	0	0
Blease	2,983	0	0
Croaker	2,928	10	0
Sanders	2,850	0	0
Rose (accepted)	2,739	0	0

For two new warehouses, Fore-street, corner of Milton-street, City. Mr. George Legg, architect:—

Browne & Robinson	£5,539	0	0
Newman & Mann	4,966	0	0
Timewell	4,744	0	0
Conder	4,710	0	0
Dove, Brothers	4,632	0	0
Hill & Sons	4,518	0	0
Elkington	4,348	0	0
Brass	4,272	0	0

For proposed new schools for the District of St. John the Evangelist, Holborn. Messrs. K. D. Young & F. W. Tasker, architects. Quantities supplied:—

Salmon (withdrawn)	£4,900	0	0
Ennor	4,190	0	0
Patman & Fotheringham	3,869	0	0
Myers	3,761	0	0
Adamson & Sons	3,734	0	0
Henshaw	3,670	0	0
Bridgman, Nuthall, & Co.	3,571	0	0
Scrivener & White	3,544	0	0
Killby	3,541	0	0
Hemming & Son	3,044	0	0

For the first pair of Village Homes, at Addlestone, for H.R.H. Princess Mary of Teck. Messrs. W. G. Habershon & Pite, architects:—

Moore	£697	0	0
Mitchell	630	0	0
Harris	627	0	0
Williams	610	0	0
Sholl	599	0	0
West	597	0	0
Lyle	593	0	0
Haynes	585	0	0
Dover, Dowell, Wills, & Co.	580	0	0
Knight	573	0	0
Simmons	570	0	0
Wagner	565	0	0
Harrison	561	0	0
Pudney	559	0	0
Goddard	555	0	0
Spearing	544	0	0
Blackmore	542	0	0
Wright	510	0	0
Gooding	510	0	0
Wood	494	12	0
Slade	494	0	0
Rooney	475	0	0
Crooke	460	0	0
Cook	460	0	0
Carmody	445	0	0
Lose	430	0	0

For St. John the Baptist Church, Islington. Mr. W. Wigginton, architect:—

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Killby	4,122	0	0
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Perry	1,925	0	0
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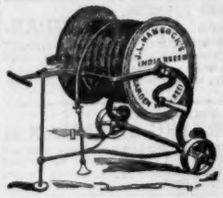

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